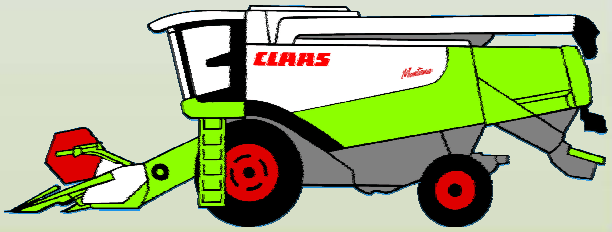
CLAAS



LEXION 570 – 520 Montana

Technical Systems

Electric System

SERVICE & PARTS

Layout of electric circuit diagrams

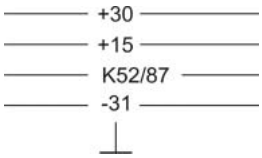
Following the circuit diagram layout, all electric circuits are shown in individual circuit diagrams. Some explanations are given below to illustrate the layout.

Numbering of circuit diagrams

Lex-e-**01a**

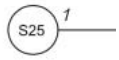
- The respective numbering can be found on the corresponding cover sheet and in the footer.
- Depending on the machine no., the components fitted and the country specification, there may be several individual circuit diagrams 01a, 01b, 01c, etc. for a given function.

Potentials

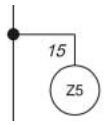


- Main power supply (battery)
- Ignition switch power supply (switched)
- Relay-controlled power supply
- Earth
- Housing earth (external)

Connections

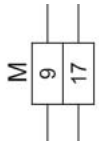


- The description provided **inside** the circle (e.g. „S25") defines the connection.
- Numbers **next to** the circle (e.g. „1") describe the continuation of the cabling in accordance with the circuit diagram numbering. This circuit diagram numbering can be taken among others from the footer.

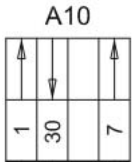


Example: Many electric circuits depend on the seat contact switch Z5 (see circuit diagram 17a). The number **next to** the circle (e.g. 15) indicates the number of the circuit diagram on which another function depending on the seat contact is shown.

Designations

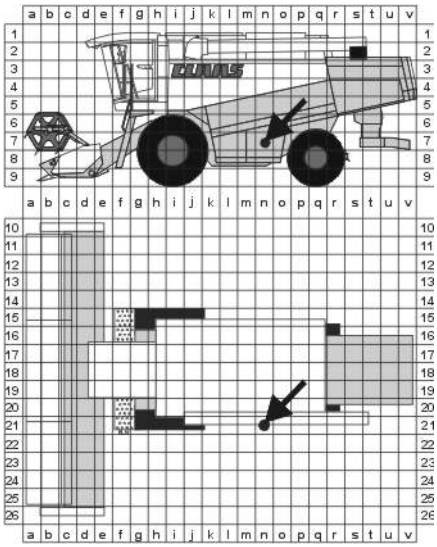


- Connectors (e.g. „M", pin 9 and 17) .
  Each chapter lists the respective connectors and their pin assignment in the individual connection tables.



- Modules (e.g. „A12 - Speed monitor")
  The arrows identify the functional inputs and outputs according to the assignment table provided in chapter **ZE.**

7-n-21 - Position of components according to component grid coordinates



A 1 ... Z 99 - Component designation according to CLAAS standards catalogue

A- Terminal / Module
B- Sensor
E- Lighting
F- Fuse
G- Voltage Source
H- Signalling Device / Lamp
K- Relay
M- Electric Motor
P- Gauge
R- Potentiometer / Resistor
S- Switches – Cab Operation
T- Switches – Terminal Operation
U- Switches – External Operation
V- Electronic Component
W- Antenna
X- Connector
Y- Solenoid coil
Z- Actual Value Function Switch

Connections list

- List of connections within the central terminal compartment, stating cross-section (mm²) and colour of cables connected to the machine.

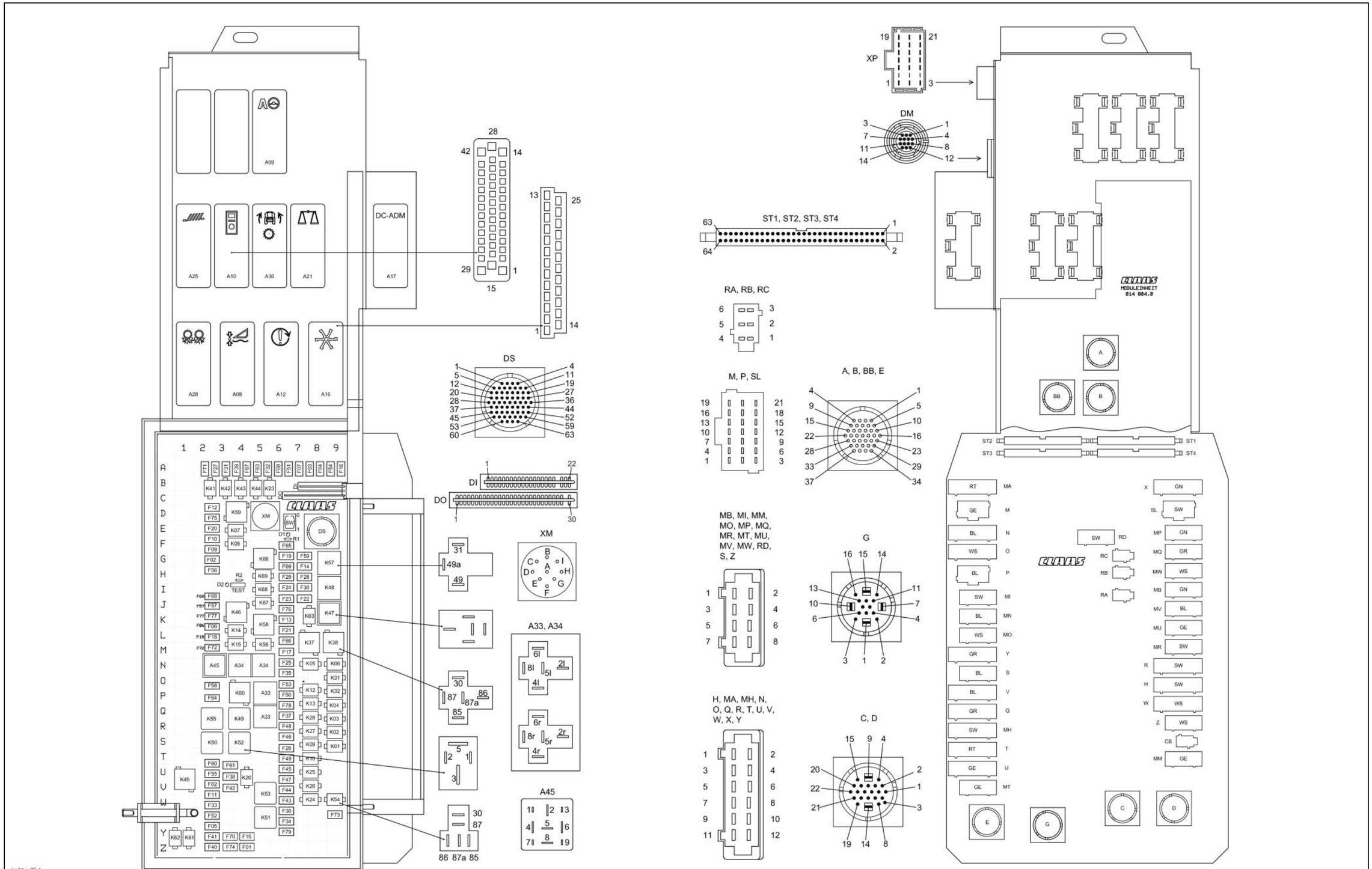
from	to 1	mm²	Colour
BB - 5	S 54	0.5	bl-wh
BB -10	Y 25	0.5	bk
MW-17	K49/86	0.75	br

rd - red
bk - black
br - brown
wh - white
bl - blue
gr -grey
ye - yellow
gn - green
pi - pink
or - orange
vi - violet

Contents:

Central terminal compartment

Central terminal compartment



Key to diagram:

		Centr. term. comp. position
	Modules	
A08	AUTOCONTOUR module (CAC)	
A09	AUTOPILOT module	
A10	Fieldwork computer module (BIF/CAB)	
A12	Speed monitor module (DZW)	
A16	Reel controller module (HAS)	
A17	Engine adaptation module (ADM)	
A21	YIELD METER module (LEM)	
A25	Sieve adjustment module	
A28	Uni-spreader module (VGS)	
A33	Sidefinder module	
A34	Grain tank module	
A37	Electro-hydraulic gearshift (EHS) module	
A45	Ground drive hydraulic motor brake restrictor module (HBM)	
	Electronic components	
DI	Warning device diode PCB	
D0	Master valve diode PCB	
DS	Diagnosis (63-pin) VIA	
ST1	Connecting cable (ribbon cable)	Connection between basic PCB and module PCB / Interconnection list on page ZE-6
ST2	Connecting cable (ribbon cable)	
ST3	Connecting cable (ribbon cable)	
ST4	Connecting cable (ribbon cable)	
	Fuses	
F1	Dipped headlights circuit	Z 4
F2	Sieve adjustment module 12 V control unit	G 2
F3	CAN connection of performance monitor	A 7-8
F4	+12 V electronic unit	A 8
F5	12 V air conditioner fan	X-Y 2
F6	Spare (plug MU)	K-L 2
F7	CAC module	A 7
F8	Reel module	A 6
F9	Yield meter	F 2
F10	Yield meter	F 2
F11	Inside work lights	V-W 2
F12	Work lights relay	C-D 2
F13	Cigarette lighter	K 6
F14	Seat socket	G-H 7
F15	Dipped headlights / Full beam	Y 4
F16	12 V CAB/DZW	A 9
F17	Electronic unit plus RIO	M 6
F18	Cutterbar quick stop	L 2
F19	Engine speed switch	G 6
F20	All-wheel drive 12 V switch	E 2
F21	Threshing mechanism relay	L 6
F22	Threshing mechanism ON	I-J 7
F23	Hazard warning switch 30	I-J 6
F24	Hazard warning switch 15	I 6
F25	Fan speed relay	N 6
F26	Reel controller	S 6
F27	Upper/lower sieve	A 2-3
F28	Autopilot switch	H 7
F29	Ground speed control lever limit switch 12 V	H 6
F30	Brake light switch 12 V / Sieve pan light	W-X 6

Key to diagram:

		Centr. term. comp. position
	Fuses	
F31	Rotary switch 12 V	A 3
F32	12 V IMO	A 5
F33	Air conditioner relay	W 2
F34	Engine ignition	X 6
F35	Fold cutterbar	N-O 6
F36	Grain tank extension	I 7
F37	12 V grain tank drive	Q 6
F38	Work light	U 3
F39	Chopper ON/OFF pushbutton	A 4
F40	Vehicle lighting switch 12 V	Z 2
F41	Warning beacon	Y 2
F42	12 V horn / wiper and washer system	V 3
F43	Position light, left-hand	W 6
F44	Position light, right-hand	V 6
F45	Left-hand full beam relay	U 6
F46	Left-hand dipped beam relay	S 6
F47	Right-hand full beam relay	U-V 6
F48	Right-hand dipped beam relay	R 6
F49	Table adjustment	T 6
F50	Grain tank extension	P 6
F51	Ignition diagnosis plug	A 6
F52	Instrument lighting	X 2
F53	Returns lighting	O 6
F54	Uni-spreader/Autopilot module	A 9
F55	Worklight switch	U 2
F56	Spare module	H 2
F57	Spare module	J 2
F58	Spare (connector H)	O 2
F59	Engine diagnosis	G 7
F60	12 V sockets LP/HP	T-U 2
F61	Sidefinder	T-U 3
F62	Outside railing worklights relay	V 2
F63	Power supply for 12 V potentiometers	A 5
F64	12V speed sensors	P 2
F65	Spare relay 40A incl. 12 V/30A	F 6
F66	12 V deflector adjustment RIO / radial spreader	L 6
F67	Rotor flaps RIO / rotor variator	A 4
F68	Wheel position worklights	I-J 2
F69	Cooling box socket outlet 12V	G-H 6
F70	Ignition switch back-up fuse	Y 3
F71	Sieve adjustment module 12V power	A 2
F72	MINI ECU	M 2
F73	Stubble lighting worklights	X 9
F74	Broadcast radio / radio 12 V constant plus	Z 3
F75	Transmission controller 12 V power supply	D 2
F76	Maintenance lights	J 6
F77	Front attachment electronic unit plus	K 2
F78	Diagnosis DC terminal 15	P-Q 6
F79	VCU terminal 30	Y 6

Key to diagram:

		Centr. term. comp. position
	Relay	
K1	Raise reel	S 9
K2	Lower reel	R-S 9
K3	Reel forward	Q-R 9
K4	Reel backward	P-Q 9
K5	Raise cutterbar	N 7-8
K6	Lower cutterbar	N 9
K7	Cutterbar left-hand cross levelling	E 3-4
K8	Cutterbar right-hand cross levelling	F 3-4
K9	Table adjustment forward	S 7-8
K10	Table adjustment backward	T 7-8
K12	Ground speed control lever zero position	P 7-8
K13	Threshing mechanism On/Off	P-Q 7-8
K14	Threshing mechanism On/Off	L 3-4
K15	Cutterbar quick stop	L-M 3-4
K20	Lighting main relay	U-V 4
K23	Generator	B-C 5
K24	Air conditioner relay	W 7-8
K25	Left-hand full beam relay	U 7-8
K26	Right-hand full beam relay	V 7-8
K27	Left-hand dipped beam relay	R-S 7-8
K28	Right-hand dipped beam relay	Q-R 7-8
K31	Grain tank extension up	O 9
K32	Grain tank extension down	P 9
K37	Fan speed -	L-M 7-8
K38	Fan speed +	L-M 8-9
K41	Upper sieve adjustment -	B-C 2
K42	Upper sieve adjustment +	B-C 3
K43	Lower sieve adjustment -	B-C 4
K44	Lower sieve adjustment +	B-C 5
K45	Work lights	U-V 1
K46	Maintenance lights	J-K 3-4
K47	Flash relay USA	J-K 8-9
K48	Indicator relay Europe	I 8-9
K49	Road travel main relay	Q-R 4
K50	Work lights relay	S 2
K51	Relay 15	X 5
K52	Ignition relay 15a	S 4
K53	Start relay	V-W 5
K54	Stubble lighting	W 9
K55	Work lights relay	Q-R 2
K56	Electronic unit plus	L-M 5
K57	Transducer	G-H 8-9
K58	Alternator relay	K-L 5
K59	Work lights relay	D 3-4
K60	Wheel position work lights	O-P 4
K61	Warning beacon	Y-Z 1
K62	Warning beacon grain tank 70% full	Y-Z 1
K63	Fan speed relay	J-K 7-8
K66	Spare relay 40 A	G 5
K67	Spare relay	J 5
K68	Spare relay	I 5
K69	Spare relay	H 5

Connecting cable Boards – Central terminal compartment
(Assignment table: Module → Connector): 1/5

Module board Module / Pin	**Connecting cable** ST 1-4	Pin	**Motherboard** Connector / Pin				
A08 01	**ST3**	**36**	K8 87	SL 10	MQ 3		
A08 02	**ST2**	**63,64**	Z 8	Q 12			
A08 03	**ST1**	**23**	MW 3	MV 3	MU 3		
A08 05	**ST2**	**43**	M 3				
A08 06	**ST2**	**51**	M 5				
A08 07	**ST4**	**13**	H 3	DS 53	W 2		
A08 08	**ST1**	**35**	E 25	DS 48			
A08 12	**ST2**	**40**	V 5	K5 87	DO 8		
A08 13	**ST2**	**36**	V 6	K6 87	DS 6		
A08 14	**ST3**	**35**	K7 87	MQ 4	SL 11		
A08 15	**ST3**	**17** **18**	F07 a	DS 5			
A08 16	**ST1**	**21**	MW 4	MV 4	MU 4		
A08 18	**ST2**	**49**	M 6				
A08 19	**ST2**	**41**	M 1				
A08 20	**ST2**	**23, 24** **25, 26** **27, 28** **29, 30** **31, 32**	N 12	F35 a	U 7		
A08 22	**ST1**	**39**	E 27				
A08 25	**ST3**	**32**	DO 1				
A10 01	**ST3**	**55, 56** **57, 58** **59, 60** **61, 62** **63, 64**	F16 a				
A10 02	**ST2**	**50**	K38 86				
A10 03	**ST4**	**13**	H 3	DS 53	W 2		
A10 04	**ST2**	**58**	P 6	MO 1			
A10 05	**ST2**	**33**	MA 8				
A10 06	**ST2**	**46**	Z 3				
A10 09	**ST3**	**54**	M 9	DI 1			
A10 10	**ST2**	**19**	P 4	R 1	A34 2R		
A10 13	**ST1**	**21**	E 30	MO 4	MP 4		
A10 14	**ST3**	**33** **34**	F04 a				
A10 15	**ST3**	**53**	V 2	DO 13			
A10 16	**ST3**	**50**	K37 86				
A10 17	**ST4**	**1**	P 14				
A10 18	**ST2**	**57**	SL 7	DS 2			
A10 19	**ST2**	**52**	O 10	DS 1	SL 8		
A10 20	**ST4**	**12**	W 1	F22 a	K63 86	MN 2	DS 52

Connecting cable Boards – Central terminal compartment
(Assignment table: Module → Connector): 2/5

Module board Module / Pin	**Connecting cable** ST 1-4	Pin	**Motherboard** Connector / Pin				
A10 24	**ST4**	**10**	O 9				
A10 27	**ST2**	**13**	G 11	XM G			
A10 29	**ST2**	**34**	V 1				
A10 32	**ST1**	**20**	Z 4				
A10 33	**ST4**	**2**	P 15				
A10 34	**ST1**	**32**	C 18	G 16	K58 86	MM 8	
A10 40	**ST1**	**23**	E 31	MO 7	MP 3		
A10 41	**ST2**	**47**	G 9	XM F			
A10 42	**ST2**	**11**	G 12	XM C			
A12 01	**ST3**	**49**	Q 1	DO 17			
A12 02	**ST3**	**38**	Y 1	Y 12	MO 8	E 1	E 12
A12 03	**ST1**	**23**	E 31	MO 7	MP 3		
A12 04	**ST1**	**19**	W 10	MN 3	DS 17		
A12 12	**ST1**	**42**	V 8	DO 15			
A12 13	**ST3**	**4**	V 7	DO 16			
A12 14	**ST2**	**10**	Q 2				
A12 15	**ST3**	**33** **34**	F04 a				
A12 16	**ST1**	**21**	E 30	MO 4	MP 4		
A12 20	**ST3**	**55, 56** **57, 58** **59, 60** **61, 62** **63, 64**	F16 a				
A12 25	**ST2**	**14**	P 7				
A16 01	**ST2**	**48**	E 6	DS 20	DO 3	K1 87	
A16 02	**ST2**	**63** **64**	Z 8	Q 12			
A16 03	**ST1**	**23**	MW 3	MV 3	MU 3		
A16 04	**ST1**	**40**	P 8	MQ 5	DO 2	DS 7	SL 12
A16 05	**ST1**	**36**	E 22				
A16 07	**ST2**	**37**	N 11				
A16 08	**ST1**	**22**	E 24				
A16 09	**ST3**	**3**	Z 5				
A16 10	**ST2**	**54**	E 28				
A16 13	**ST2**	**22**	Q 7	DS 24			
A16 14	**ST2**	**56**	E 7	K2 87	DS 21		
A16 15	**ST3**	**1,2**	F08 a				
A16 16	**ST1**	**21**	MW 4	MV 4	MU 4		
A16 17	**ST1**	**34**	E 29	MA 12			
A16 18	**ST3**	**20**	K3 86	K3 30	K4 86	K4 30	K2 30
A16 20	**ST3**	**19, 20** **21, 22** **23, 24** **25, 26** **27, 28**	Q 4	F26 a	K1 86	K1 30	K2 86

Connecting cable Boards – Central terminal compartment
(Assignment table: Module → Connector): 3/5

Module board Module / Pin	**Connecting cable** ST 1-4 Pin	**Motherboard** Connector / Pin				
A16 21	**ST1 38**	E 23				
A16 22	**ST2 45**	Q 3				
A16 25	**ST2 44**	Q 8	DS 25			
A25 01	**ST4 4**	K42 86				
A25 02	**ST3 39**	MH 2	MH 7	MU 2	MP 2	H 1
A25 03	**ST1 23**	A45 3	SL 4	MR 3	DS 62	
A25 08	**ST2 39**	DS 46				
A25 12	**ST4 3**	K41 86				
A25 13	**ST4 6**	K44 86				
A25 14	**ST4 5**	K43 86				
A25 15	**ST4 17**	MV 1	F02 a	MW 1		
A25 16	**ST1 21**	A45 9	SL 5	MR 4	DS 63	
A25 20	**ST1 61, 62 63, 64**	F71 a				
A28 02	**ST3 40**	R 3	MV 2	K55 85	O 4	MW 2
A28 03	**ST1 23**	A45 3	SL 4	MR 3	DS 62	
A28 07	**ST1 1, 2, 3, 4 5, 6, 7, 8 9, 10**	DS 49	MN 7			
A28 11	**ST1 26**	DS 47				
A28 12	**ST1 11, 12 13, 14**	DS 26	MN 5			
A28 13	**ST1 53, 54 55, 56**	DS 27	MN 6			
A28 15	**ST3 51 52**	MR 1	F54 a			
A28 16	**ST1 21**	A45 9	SL 5	MR 4	DS 63	
A28 20	**ST1 1, 2, 3, 4, 5, 6, 7, 8, 9, 10**	DS 49	MN 7			
A28 25	**ST1 15, 16 17, 18**	MN 8				
A28 13	**ST1 53, 54 55, 56**	DS 27	MN 6			
A28 15	**ST3 51, 52**	MR 1	F54 a			
A28 16	**ST1 21**	A45 9	SL 5	MR 4	DS 63	
A28 20	**ST1 1, 2, 3, 4, 5, 6, 7, 8 9, 10**	DS 49	MN 7			
A28 25	**ST1 15, 16, 17, 18**	MN 8				

Connecting cable Boards – Central terminal compartment
(Assignment table: Module → Connector): 4/5

Module board Module / Pin	**Connecting cable** ST 1-4 Pin	**Motherboard** Connector / Pin				
A 01	**ST4 19**	U 10	SL 20			
A 04	**ST4 15**	MN 4	DS 33			
A 05	**ST2 59 60**	A34 4R	H 6	DS 16	W 4	
A 06	**ST1 24**	G 14	K24 85			
A 08	**ST2 61**	A34 8L	W 3	H 5	M 21	DS 15
A 09	**ST1 29**	MH 6				
A 10	**ST1 33**	MH 8				
A 11	**ST2 9**	T 8	Y 2	SL 6		
A 12	**ST2 53**	G 6	DI 13			
A 14	**ST1 31**	MH 5	K62 85			
A 15	**ST2 55**	W 9	DI 4			
A 16	**ST2 62**	W 5				
A 17	**ST2 21**	K23 87a	G 13			
A 18	**ST4 16**	K57 49a	C 20			
A 19	**ST1 23**	E 31	MO 7	MP 3		
A 20	**ST1 21**	E 30	MO 4	MP 4		
A 21	**ST1 43, 44 45, 46 47, 48 49, 50 51, 52**	F32 a				
A 22	**ST2 1, 2, 3, 4, 5, 6, 7, 8**	MA 10	DS 61	U 4	MT 8	K46 85
A 23	**ST3 5, 6, 7, 8, 9, 10, 11, 12, 13, 14**	F51 a	DS 58	DS 59		
A 28	**ST4 7, 8, 9**	F31 a	DS 56			
A 34	**ST2 63 64**	Z 8	Q 12			
B 01	**ST1 41**	Z 6	DS 51	F64 a		
B 02	**ST4 18**	F17 a	MO 5	SL 14	K5 86	K5 30
B 03	**ST4 50, 51 52, 53 54, 55 56, 57 58, 59 60, 61 62, 63 64**	F67 a				
B 07	**ST4 5**	K43 86				
B 08	**ST4 6**	K44 86				
B 09	**ST4 3**	K41 86				
B 10	**ST4 4**	K42 86				

Connecting cable Boards – Central terminal compartment
(Assignment table: Module → Connector): 5/5

Module board Module / Pin	**Connecting cable** ST 1-4	Pin	**Motherboard** Connector / Pin				
B 11	**ST1**	**61, 62 63, 64**	F71 a				
B 13	**ST1**	**23**	MW 3	MV 3	MU 3		
B 14	**ST1**	**21**	MW 4	MV 4	MU 4		
B 15	**ST4**	**32, 33 34, 35 36, 37 38, 39 40, 41**	F39 a				
B 16	**ST4**	**42, 43 44, 45**	Q 6	DS 18	DO 22		
B 17	**ST4**	**46, 47 48, 49**	Q 5	DS 19	DO 20		
B 20	**ST2**	**59, 60**	A34 4R	H 6	DS 16	W 4	
B 23	**ST1**	**34**	E 29	MA 12			
B 24	**ST3**	**29**	F03 a	MU 1			
B 25	**ST2**	**2**	P 12	MI 2	T 7	T 6	C 16
B 26	**ST4**	**20, 21 22, 23**	K41 30				
B 27	**ST4**	**24, 25 26, 27**	K42 30				
B 28	**ST4**	**28, 29 30, 31**	K43 30				
B 29	**ST1**	**57, 58 59, 60**	K44 30				
B 30	**ST1**	**27, 28**	DS 57	MU 8	MR 5	F63 a	
B 31	**ST1**	**35**	E 25	DS 48			
B 33	**ST2**	**64**	CB 2	Bridge a	E 37		
B 34	**ST2**	**39**	DS 46				
BB 10	**ST1**	**35**	E 25	DS 48			
BB 12	**ST2**	**64**	CB 2	Bridge a	E 37		
BB 13	**ST1**	**27, 28**	DS 57	MU 8	MR 5	F63 a	
BB 19	**ST1**	**26**	DS 47				
BB 24	**ST1**	**41**	Z 6	DS 51	F64 a		
BB 29	**ST2**	**3**	MQ 8	V 12	V 11	MT 4	MT 3
	ST2	**24**	K6 30	K6 86	K7 86	K7 30	
	ST2	**25**	K8 86	K8 30			
	ST2	**15, 16 17, 18**					
	ST3	**15, 16**					

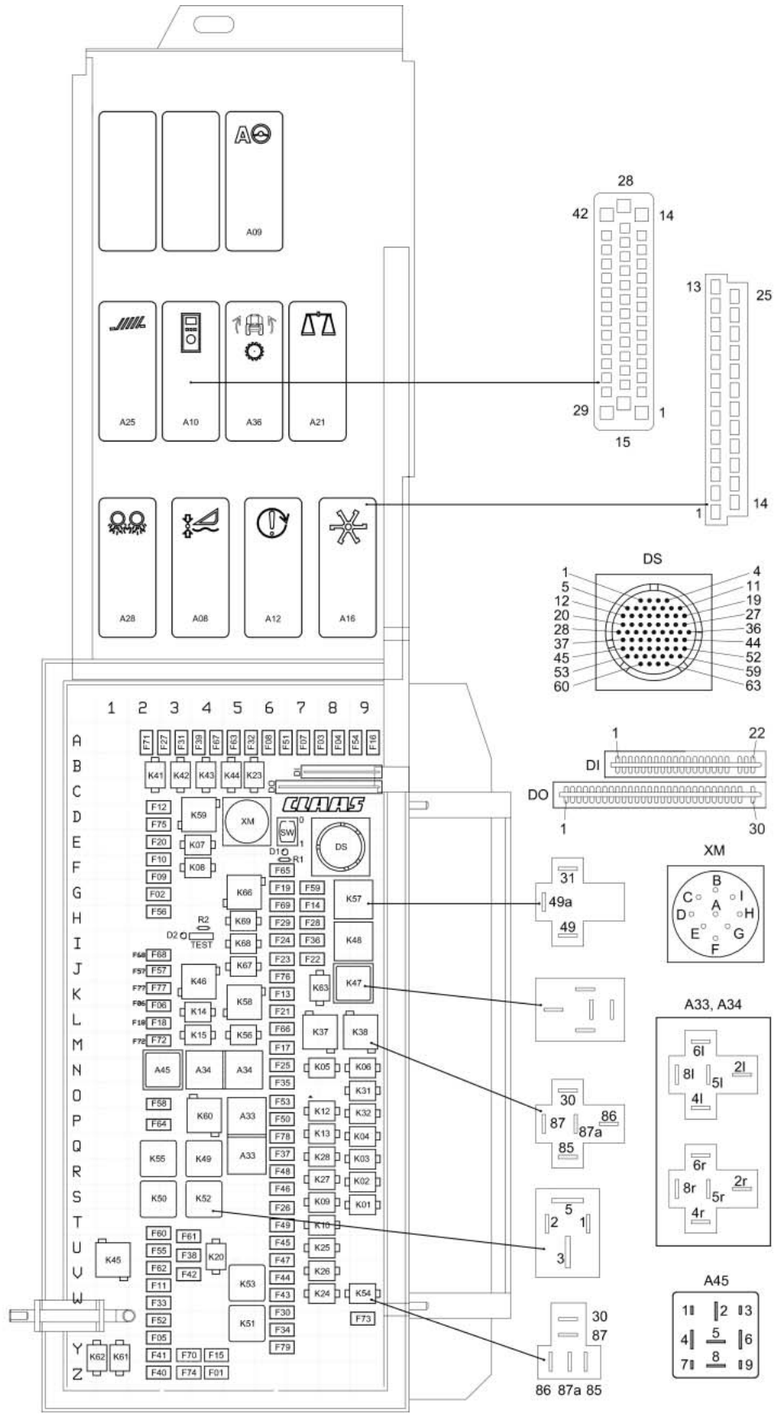
Central terminal compartment

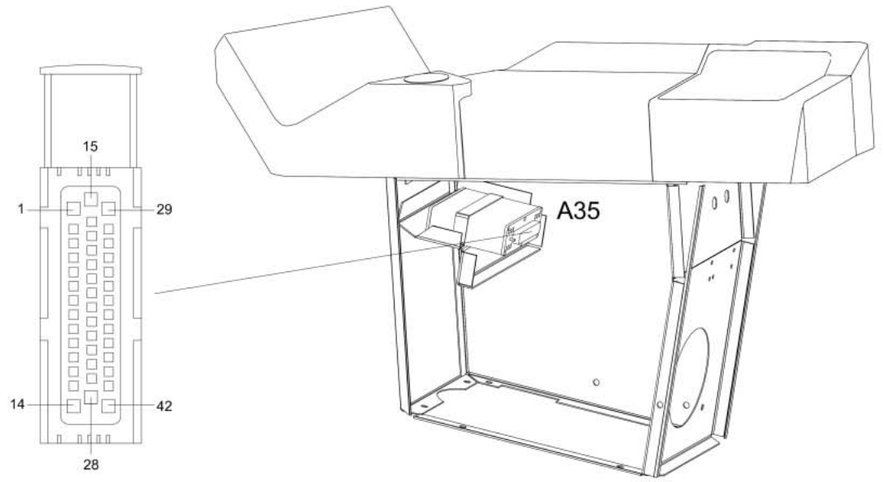
Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

Central terminal compartment Montana 570-520 - with external MONTANA control unit
(up to serial no. 582 00051, 581 00026; 580 00028)





mon04-e-ze-1

Key to diagram:

		Centr. term. comp. position
	Modules	
A08	AUTOCONTOUR module (CAC)	
A09	AUTOPILOT module	
A10	Fieldwork computer module (BIF/CAB)	
A12	Speed monitor module (DZW)	
A16	Reel controller module (HAS)	
A17	Engine adaptation module (ADM)	
A21	YIELD METER module (LEM)	
A25	Sieve adjustment module	
A28	Uni-spreader module (VGS)	
A33	Sidefinder module	
A34	Grain tank module	
A35	MONTANA control unit module	
A36	MONTANA gearshift control module	
A45	Ground drive hydraulic motor brake restrictor module (HBM)	
	Electronic components	
DI	Warning device diode PCB	
D0	Master valve diode PCB	
DS	Diagnosis (63-pin) VIA	
ST1	Connecting cable (ribbon cable)	Connection between basic PCB and module PCB / Interconnection list on page ZE-6
ST2	Connecting cable (ribbon cable)	
ST3	Connecting cable (ribbon cable)	
ST4	Connecting cable (ribbon cable)	
	Fuses	
F1	Dipped headlights circuit	Z 4
F2	Sieve adjustment module 12 V control unit	G 2
F3	CAN connection of performance monitor	A 7-8
F4	+12 V electronic unit	A 8
F5	12 V air conditioner fan	X-Y 2
F6	Spare (MU connector)	K-L 2
F7	CAC module	A 7
F8	Reel module	A 6
F9	Yield meter	F 2
F10	Yield meter	F 2
F11	Inside work lights	V-W 2
F12	Work lights relay	C-D 2
F13	Cigarette lighter	K 6
F14	Seat socket	G-H 7
F15	Dipped headlights / Full beam	Y 4
F16	12 V CAB/DZW	A 9
F17	Electronic unit plus	M 6
F18	Cutterbar quick stop	L 2
F19	Engine speed switch	G 6
F20	All-wheel drive 12 V switch	E 2
F21	Threshing mechanism relay	L 6
F22	Threshing mechanism ON	I-J 7
F23	Hazard warning switch 30	I-J 6
F24	Hazard warning switch 15	I 6
F25	Fan speed relay	N 6
F26	Reel controller	S 6
F27	Upper/lower sieve	A 2-3
F28	Autopilot switch	H 7
F29	Ground speed control lever limit switch 12 V	H 6
F30	Brake light switch 12 V / Sieve pan light	W-X 6

Key to diagram:

		Centr. term. comp. position
	Fuses	
F31	Rotary switch 12 V	A 3
F32	12 V IMO	A 5
F33	Air conditioner relay	W 2
F34	Engine ignition	X 6
F35	Cutterbar fold	N-O 6
F36	Grain tank extension	I 7
F37	12 V grain tank drive	Q 6
F38	Work light	U 3
F39	Chopper On/Off pushbutton	A 4
F40	Vehicle lighting switch 12 V	Z 2
F41	Warning beacon	Y 2
F42	12 V horn / wiper and washer system	V 3
F43	Position light, left-hand	W 6
F44	Position light, right-hand	V 6
F45	Left-hand full beam relay	U 6
F46	Left-hand dipped beam relay	S 6
F47	Right-hand full beam relay	U-V 6
F48	Right-hand dipped beam relay	R 6
F49	Table adjustment	T 6
F50	Grain tank extension	P 6
F51	Ignition diagnosis plug	A 6
F52	Instrument lighting	X 2
F53	Returns lighting	O 6
F54	Uni-spreader/Autopilot module	A 9
F55	Worklight switch	U 2
F56	Spare module	H 2
F57	Spare module	J 2
F58	Spare (connector H)	O 2
F59	Engine diagnosis	G 7
F60	12V sockets LP/HP	T-U 2
F61	Sidefinder	T-U 3
F62	Outside railing worklights relay	V 2
F63	Power supply for 12 V potentiometers	A 5
F64	12 V speed sensors	P 2
F65	Spare relay 40 A incl. 12 V/30 A	F 6
F66	12 V Deflector adjustment / Radial spreader	L 6
F67	Rotor flaps / rotor variator	A 4
F68	Wheel position worklights	I-J 2
F69	Cooling box socket outlet 12 V	G-H 6
F70	Ignition switch back-up fuse	Y 3
F71	Sieve adjustment module 12 V power	A 2
F72	MINI ECU	M 2
F73	Stubble lighting worklights	X 9
F74	Radio / Mobile radio 12 V constant plus	Z 3
F75	Transmission controller 12 V power supply	D 2
F76	Maintenance lights	J 6
F77	Front attachment electronic unit plus	K 2
F78	Diagnosis DC terminal 15	P-Q 6
F79	VCU terminal 30	Y 6

Key to diagram:

		Centr. term. comp. position
	Relays	
K1	Raise reel	S 9
K2	Lower reel	R-S 9
K3	Reel forward	Q-R 9
K4	Reel backward	P-Q 9
K5	Raise cutterbar	N 7-8
K6	Lower cutterbar	N 9
K7	Cutterbar left-hand lateral levelling	E 3-4
K8	Cutterbar right-hand lateral levelling	F 3-4
K9	Table adjustment forward	S 7-8
K10	Table adjustment backward	T 7-8
K12	Ground speed control lever zero position	P 7-8
K13	Threshing mechanism On/Off	P-Q 7-8
K14	Threshing mechanism On/Off	L 3-4
K15	Cutterbar quick stop	L-M 3-4
K20	Lighting main relay	U-V 4
K23	Alternator	B-C 5
K24	Air conditioner relay	W 7-8
K25	Left-hand full beam relay	U 7-8
K26	Right-hand full beam relay	V 7-8
K27	Left-hand dipped beam relay	R-S 7-8
K28	Right-hand dipped beam relay	Q-R 7-8
K31	Grain tank extension up	O 9
K32	Grain tank extension down	P 9
K37	Fan speed -	L-M 7-8
K38	Fan speed +	L-M 8-9
K41	Upper sieve adjustment -	B-C 2
K42	Upper sieve adjustment +	B-C 3
K43	Lower sieve adjustment -	B-C 4
K44	Lower sieve adjustment +	B-C 5
K45	Work lights	U-V 1
K46	Maintenance lights	J-K 3-4
K47	Flash relay USA	J-K 8-9
K48	Indicator relay Europe	I 8-9
K49	Road travel main relay	Q-R 4
K50	Work lights relay	S 2
K51	Relay 15	X 5
K52	Ignition relay 15a	S 4
K53	Start relay	V-W 5
K54	Stubble lighting	W 9
K55	Work lights relay	Q-R 2
K56	Electronic unit plus	L-M 5
K57	Transducer	G-H 8-9
K58	Alternator relay	K-L 5
K59	Work lights relay	D 3-4
K60	Wheel position work lights	O-P 4
K61	Warning beacon	Y-Z 1
K62	Warning beacon grain tank 70% full	Y-Z 1
K63	Fan speed relay	J-K 7-8
K66	Spare relay 40 A	G 5
K67	Spare relay	J 5
K68	Spare relay	I 5
K69	Spare relay	H 5

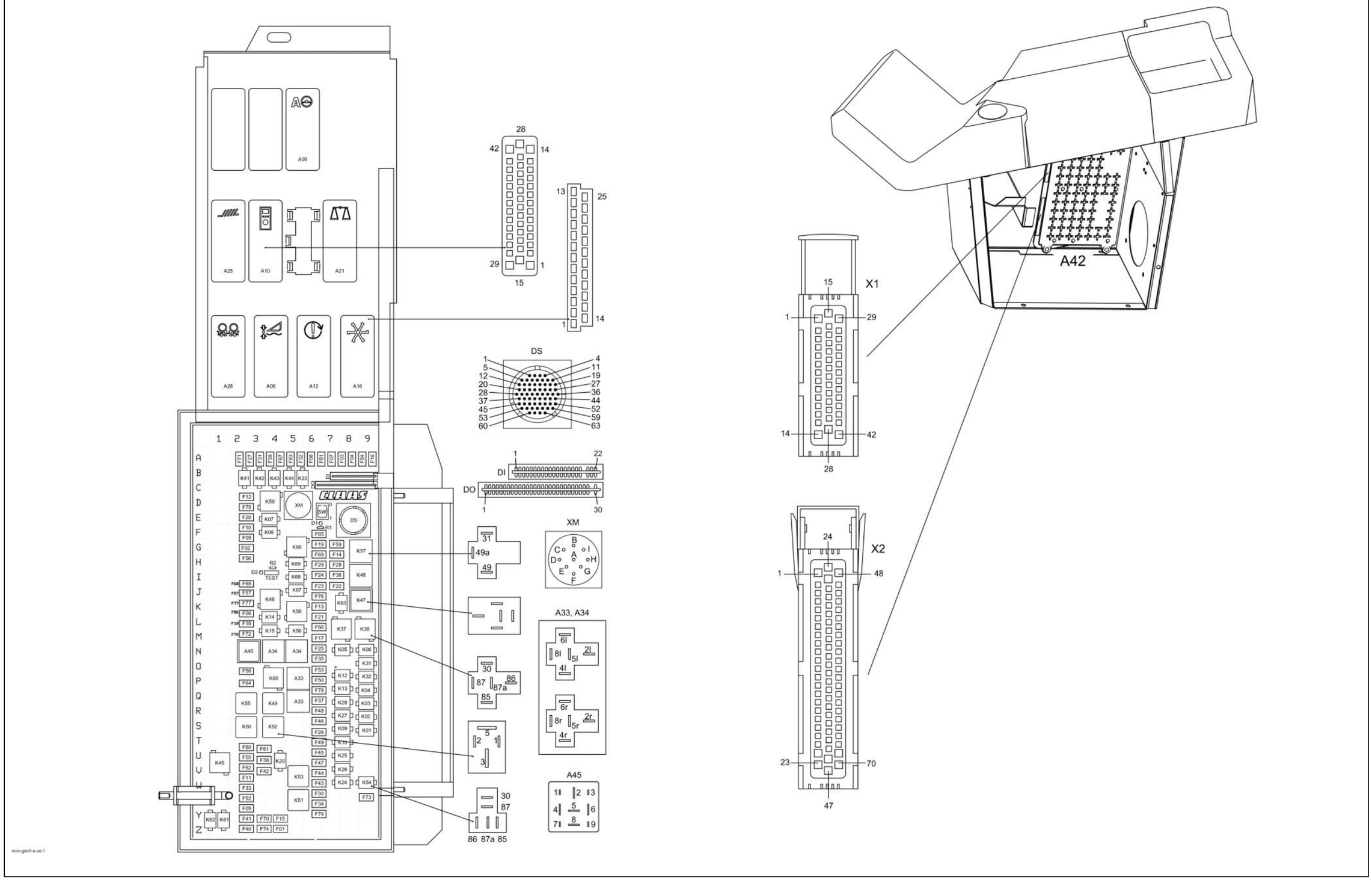
Central terminal compartment

Montana 570-520

- with integrated MONTANA control unit

- from serial no. 581 00027 to 581 00037

Central terminal compartment Montana 570-520 - with integrated MONTANA control unit
(from serial no. 581 00027 to 581 00037)



Key to diagram:

		Centr. term. comp. position
	Modules	
A08	AUTOCONTOUR module (CAC)	
A09	AUTOPILOT module	
A10	Fieldwork computer module (BIF/CAB)	
A12	Speed monitor module (DZW)	
A16	Reel controller module (HAS)	
A17	Engine adaptation module (ADM)	
A21	YIELD METER module (LEM)	
A25	Sieve adjustment module	
A28	Uni-spreader module (VGS)	
A33	Sidefinder module	
A34	Grain tank module	
A42	MONTANA GEN II module	
A45	Ground drive hydraulic motor brake restrictor module (HBM)	
	Electronic components	
DI	Warning device diode PCB	
D0	Master valve diode PCB	
DS	Diagnosis (63-pin) VIA	
ST1	Connecting cable (ribbon cable)	Connection between basic PCB and module PCB / Interconnection list on page ZE-6
ST2	Connecting cable (ribbon cable)	
ST3	Connecting cable (ribbon cable)	
ST4	Connecting cable (ribbon cable)	
	Fuses	
F1	Dipped headlights circuit	Z 4
F2	Sieve adjustment module 12 V control unit	G 2
F3	CAN connection of performance monitor	A 7-8
F4	+12 V electronic unit	A 8
F5	12 V air conditioner fan	X-Y 2
F6	Spare (MU connector)	K-L 2
F7	CAC module	A 7
F8	Reel module	A 6
F9	Yield meter	F 2
F10	Yield meter	F 2
F11	Inside work lights	V-W 2
F12	Work lights relay	C-D 2
F13	Cigarette lighter	K 6
F14	Seat socket	G-H 7
F15	Dipped headlights / Full beam	Y 4
F16	12 V CAB/DZW	A 9
F17	Electronic unit plus	M 6
F18	Cutterbar quick stop	L 2
F19	Engine speed switch	G 6
F20	All-wheel drive 12 V switch	E 2
F21	Threshing mechanism relay	L 6
F22	Threshing mechanism ON	I-J 7
F23	Hazard warning switch 30	I-J 6
F24	Hazard warning switch 15	I 6
F25	Fan speed relay	N 6
F26	Reel controller	S 6
F27	Upper/lower sieve	A 2-3
F28	Autopilot switch	H 7
F29	Ground speed control lever limit switch 12 V	H 6
F30	Brake light switch 12 V / Sieve pan light	W-X 6

Key to diagram:

		Centr. term. comp. position
	Fuses	
F31	Rotary switch 12 V	A 3
F32	12 V IMO	A 5
F33	Air conditioner relay	W 2
F34	Engine ignition	X 6
F35	Cutterbar fold	N-O 6
F36	Grain tank extension	I 7
F37	12 V grain tank drive	Q 6
F38	Work light	U 3
F39	Chopper On/Off pushbutton	A 4
F40	Vehicle lighting switch 12 V	Z 2
F41	Warning beacon	Y 2
F42	12 V horn / wiper and washer system	V 3
F43	Position light, left-hand	W 6
F44	Position light, right-hand	V 6
F45	Left-hand full beam relay	U 6
F46	Left-hand dipped beam relay	S 6
F47	Right-hand full beam relay	U-V 6
F48	Right-hand dipped beam relay	R 6
F49	Table adjustment	T 6
F50	Grain tank extension	P 6
F51	Ignition diagnosis plug	A 6
F52	Instrument lighting	X 2
F53	Returns lighting	O 6
F54	Uni-spreader/Autopilot module	A 9
F55	Worklight switch	U 2
F56	Spare module	H 2
F57	Spare module	J 2
F58	Spare (connector H)	O 2
F59	Engine diagnosis	G 7
F60	12V sockets LP/HP	T-U 2
F61	Sidefinder	T-U 3
F62	Outside railing worklights relay	V 2
F63	Power supply for 12 V potentiometers	A 5
F64	12 V speed sensors	P 2
F65	Spare relay 40 A incl. 12 V/30 A	F 6
F66	12 V Deflector adjustment / Radial spreader	L 6
F67	Rotor flaps / rotor variator	A 4
F68	Wheel position worklights	I-J 2
F69	Cooling box socket outlet 12 V	G-H 6
F70	Ignition switch back-up fuse	Y 3
F71	Sieve adjustment module 12 V power	A 2
F72	MINI ECU	M 2
F73	Stubble lighting worklights	X 9
F74	Radio / Mobile radio 12 V constant plus	Z 3
F75	Transmission controller 12 V power supply	D 2
F76	Maintenance lights	J 6
F77	Front attachment electronic unit plus	K 2
F78	Diagnosis DC terminal 15	P-Q 6
F79	VCU terminal 30	Y 6

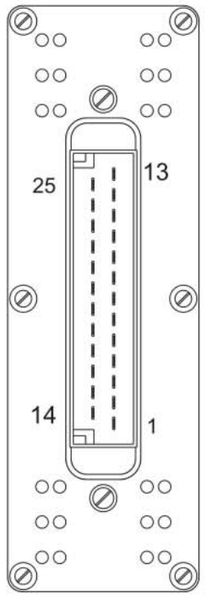
Key to diagram:

		Centr. term. comp. position
	Relays	
K1	Raise reel	S 9
K2	Lower reel	R-S 9
K3	Reel forward	Q-R 9
K4	Reel backward	P-Q 9
K5	Raise cutterbar	N 7-8
K6	Lower cutterbar	N 9
K7	Cutterbar left-hand lateral levelling	E 3-4
K8	Cutterbar right-hand lateral levelling	F 3-4
K9	Table adjustment forward	S 7-8
K10	Table adjustment backward	T 7-8
K12	Ground speed control lever zero position	P 7-8
K13	Threshing mechanism On/Off	P-Q 7-8
K14	Threshing mechanism On/Off	L 3-4
K15	Cutterbar quick stop	L-M 3-4
K20	Lighting main relay	U-V 4
K23	Alternator	B-C 5
K24	Air conditioner relay	W 7-8
K25	Left-hand full beam relay	U 7-8
K26	Right-hand full beam relay	V 7-8
K27	Left-hand dipped beam relay	R-S 7-8
K28	Right-hand dipped beam relay	Q-R 7-8
K31	Grain tank extension up	O 9
K32	Grain tank extension down	P 9
K37	Fan speed -	L-M 7-8
K38	Fan speed +	L-M 8-9
K41	Upper sieve adjustment -	B-C 2
K42	Upper sieve adjustment +	B-C 3
K43	Lower sieve adjustment -	B-C 4
K44	Lower sieve adjustment +	B-C 5
K45	Work lights	U-V 1
K46	Maintenance lights	J-K 3-4
K47	Flash relay USA	J-K 8-9
K48	Indicator relay Europe	I 8-9
K49	Road travel main relay	Q-R 4
K50	Work lights relay	S 2
K51	Relay 15	X 5
K52	Ignition relay 15a	S 4
K53	Start relay	V-W 5
K54	Stubble lighting	W 9
K55	Work lights relay	Q-R 2
K56	Electronic unit plus	L-M 5
K57	Transducer	G-H 8-9
K58	Alternator relay	K-L 5
K59	Work lights relay	D 3-4
K60	Wheel position work lights	O-P 4
K61	Warning beacon	Y-Z 1
K62	Warning beacon grain tank 70% full	Y-Z 1
K63	Fan speed relay	J-K 7-8
K66	Spare relay 40 A	G 5
K67	Spare relay	J 5
K68	Spare relay	I 5
K69	Spare relay	H 5

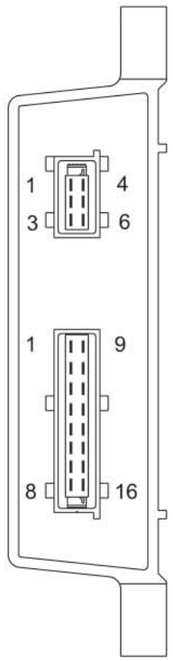
Pin assignment in modules

Pin assignment in modules

A8, A9, A12, A13, A16, A21, A25, A27, A28, A37



A38, A46



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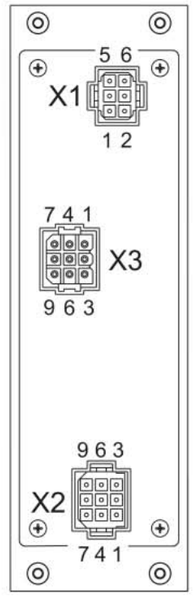

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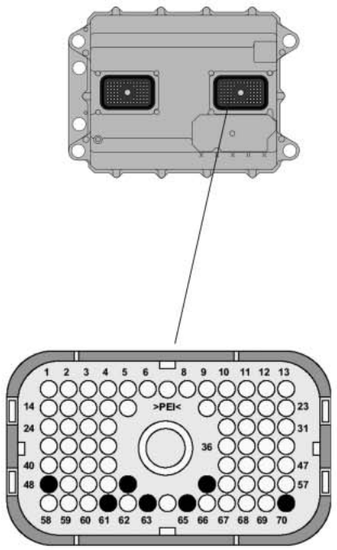

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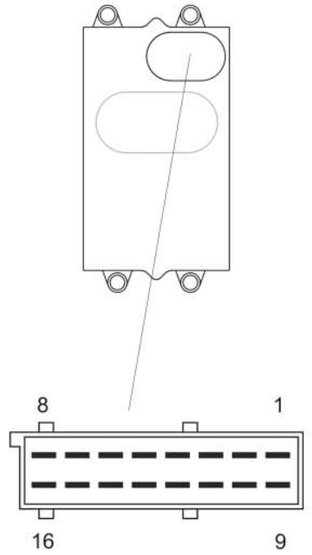

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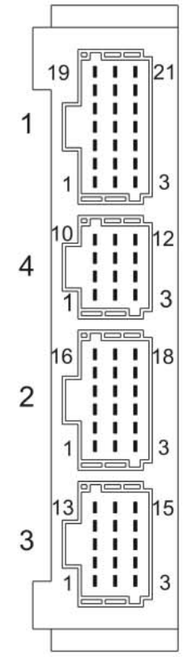
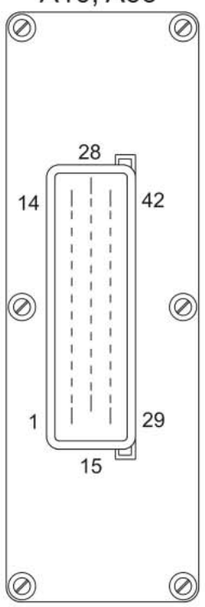


A10, A66



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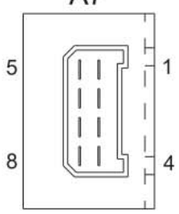
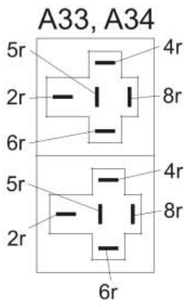


A33, A34



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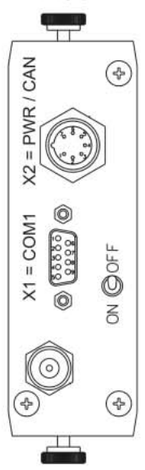

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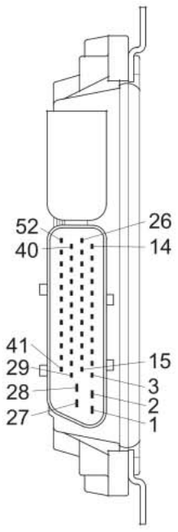
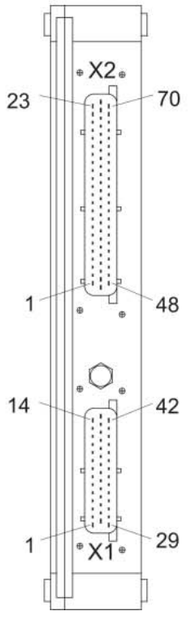
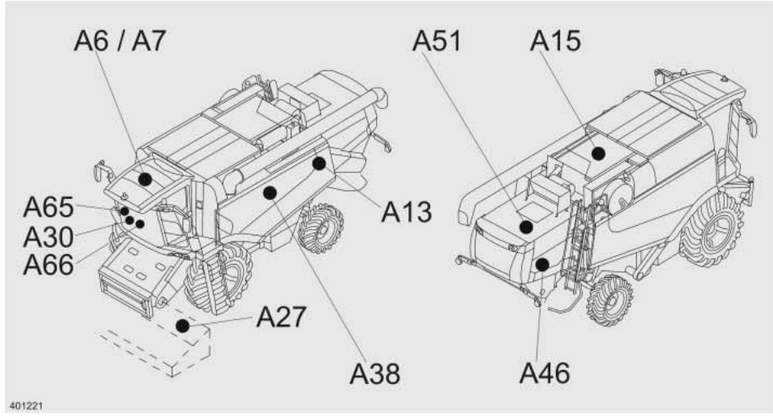


A42





401222-1

Module A6 - Automatic air conditioner

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1/ 1	Terminal 61	G 2	12 V	Input	01a
1/ 2	Power	a8 / 30 A	12 V	Input	38b
1/ 5	Instrument lighting	E 35	12 V	Output	36a
1/ 6	Earth	-31	0 V	Input	38b
2/ 1	Icing protection	Z 74	12 V	Output	38b
2/ 2	Heater solenoid coil	Y109	12 V (PWM)	Output	38b
2/ 3	PWM fan	M 7	12 V (PWM)	Output	38b
2/ 9	Power	a8 / 30 A	12 V	Input	38b
3/ 1	Inside temperature	B86	-20° - 97070 Ω	---	38b
3/ 2	Inside temperature	B86	-10° - 55330 Ω	---	38b
3/ 3	Blow-out temperature	B87	0° - 32650 Ω	---	38b
3/ 4	Blow-out temperature	B87	10° - 19900 Ω	---	38b
3/ 5	Outside temperature	B88	20° - 12490 Ω	---	38b
3/ 6	Outside temperature	B88	30° - 8057 Ω	---	38b
			40° - 5327 Ω		

Module A7 - Cab fan speed controller

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Earth	-31	0 V	Output	38b
2	not used	---	---	---	---
3	not used	---	---	---	---
4	Power	M7	0-12 V	Output	38b
5	Earth	M7	0 V	Input	38b
6	not used	---	---	---	---
7	PWM fan	A6	12 V (PWM)	Input	38b
8	Power	A7	12 V	Input	38b

Module A8 - AUTOCONTOUR (CAC)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Cross levelling, right-hand*	Y68	12 V	Output*	20
2	Earth (GND)	-32	Earth	Input	6
3	CAN high	-	-	-	6
4	---	---	---	---	---
5	Slowly raise front attachment signal	S38a	Earth	Input	20
6	Pre-set cutting height control signal	S38d	Earth	Input	24
7	Front attachment circuit signal	K16/87	12 V	Input	17
8	Reference voltage	B7/B8	5 V	Output	28
9	Feed rake conveyor position – actual value	B35	0.25-4.75 V	Input	24
10	Left-hand sensing band actual value signal	B3	0.25-4.75 V	Input	24
11	---	---	---	---	---
12	Raise front attachment	Y85	12 V	Output	20
13	Lower front attachment	Y87	12 V	Output	20
14	Cross levelling, left-hand*	Y67	12 V	Output*	20
15	Electronic unit	F7	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	Cutting height control signal	S38c	Earth	Input	24
19	Slowly lower front attachment signal	S38b	Earth	Input	20
20	Power	F35	12 V / 15 A	Input	20
21	---	---	---	---	---
22	Left-hand sensing band actual value signal	B4	0.25-4.75 V	Input	24
23	Cutterbar spring actual value signal	B68	0.25-4.75 V	Input	24
24	---	---	---	---	---
25	Master valve	Y77	12 V	Output	4

* - Pin1 and pin14 are also used as signal input for manual cross levelling (see diagram 20)

Module A9 – AUTOPILOT (ATP)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Laser right-hand changeover	S96	12 V	Input	28
2	Earth (GND)	-31	Earth	Input	6, 28
3	CAN high	---	---	---	6
4	---	---	---	---	---
5	ATP signal OFF	B83	Earth	Input	28
6	---	---	---	---	---
7	Power	S10	12 V / 15 A	Input	28
8	Touch sensor reference voltage	R3	5 V	Output	28
9	Wheel angle actual value signal	B6	0.25-4.75 V	Input	28
10	Centralizing switch set value signal	R3	0.25-4.75 V	Input	28
11	Pressure sensor signal (0-250 bar, linear)	B5	0.25-4.75 V	Input	28
12	Steering left	Y9	12 V	Output	28
13	Steering right	Y10	12 V	Output	28
14	ATP control	H2	12 V	Input	28
15	Electronic unit	F54	12 V / 1 A	Input	6
16	CAN low	---	---	---	6
17	---	---	---	---	---
18	ATP ON signal	S9	Earth	Input	28
19	Seat contact signal	Z5	Earth	Input	15, 16, 17, 28
20	Power	S10	12 V / 15 A	Input	28
21	Left-hand touch sensor or laser pilot actual value signal	B7, B50	0.25-4.75 V	Input	28
22	Right-hand touch sensor actual value signal	B8	0.25-4.75 V	Input	28
23	Laser pilot or left-hand touch sensor actual value signal	B7, B50	0.25-4.75 V	Input	28
24	ATP signal OFF	B83	Earth	Input	28
25	Master valve	Y77	12 V	Output	4

Module A10 - Fieldwork computer (BIF/CAB)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Power	F16	12 V / 7.5 A	Input	8
2	Fan speed +	K38/86	12V	Output	10
3	Front attachment ON	Y88	12 V (PWM)	Output	17
4	Reverse travel signal (ha counter OFF)	Z50	12 V	Input	49
5	Front attachment ON signal	S95	12 V	Input	17
6	---	---	---	---	---
7	Fuel tank filling signal	B43	0.25 - 4.75 V	Input	32
8	Main drive speed signal	B18	0.4 V - 4.6 V	Input	25
9	Front attachment OFF signal	S54	Earth	Input	17
10	Seat contact	Z5	Earth	Input	15, 17
11	---	---	---	---	---
12	---	---	---	---	---
13	CAN 1 low	-	-	-	6
14	Electronic unit	F4	12 V / 1 A	Input	6
15	Threshing drum speed +	Y20	12 V	Output	8
16	Fan speed -	K37/86	12 V	Output	10
17	Rotor flaps half open	S97	12 V	Input	9
18	Diesel engine signal 3rd gear	Z95	12 V	Input	44
19	Diesel engine full throttle signal	S35	12 V	Input	2
20	Threshing mechanism circuit signal (working hours)	F22	12 V	Input	7
21	Fan speed signal	B15	0.4 V - 4.6 V	Input	25
22	Radial spreader speed signal	B89	0.4 V - 4.6 V	Input	25
23	---	---	---	---	---
24	Diesel engine half throttle signal	S35	12 V	Input	2
25	---	---	---	---	---
26	Reference voltage	R29	5 V	Output	12
27	CAN 2 high (J1939)	-	-	-	-
28	Earth (GND)	-31	Earth	Input	6
29	Threshing drum speed -	Y19	12 V	Output	8
30	Additional fuel tank	Y91	12 V	Output	32
31	Spreading direction signal	R29	1.7 - 6.4 KΩ	Input	13
32	---	---	---	---	---
33	Rotor flaps close	S97	12 V	Input	9
34	Alternator / Pin 61 signal (engine hours)	G2	14 V	Input	1
35	Threshing drum speed signal	B11	0.4 V - 4.6 V	Input	25
36	Ground speed signal (trip)	B16	0.4 V - 4.6 V	Input	25
37	---	---	---	---	---
38	Spreading width signal	R27	1.7 - 6.4 KΩ	Input	13
39	---	---	---	---	---
40	CAN 1 high	---	---	---	6
41	CAN 2 low (J1939)	---	---	---	2
42	CAN 2 screening (J1939)	---	---	---	2

Module A12 - Speed monitor (DZW)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Front attachment speed +	Y90	12 V	Output	18
2	Earth (GND)	-31	Earth	Input	6
3	CAN high	-	-	-	6
4	Chopper circuit signal (chopper operating hours)	Z58	12 V	Input	19
5	Feed rake conveyor speed signal	B12	0.4 V - 4.6 V	Input	25
6	Grain elevator speed signal	B21	0.4 V - 4.6 V	Input	25
7	Rotor / finger roller speed signal	B24/B74	0.4 V - 4.6 V	Input	25
8	Uni-spreader speed signal	B27	0.4 V - 4.6 V	Input	25
9	---	---	---	---	---
10	---	---	---	---	---
11	Concave position signal	B30	0.25 - 4.75 V	Input	8
12	Concave clearance +	Y18	12 V	Output	8
13	Concave clearance -	Y17	12 V	Output	8
14	Front attachment speed -	Y89	12 V	Output	18
15	Electronic unit	F4	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	Returns speed signal	B29	0.4 V - 4.6 V	Input	25
19	Chopper speed / uni-spreader speed signal	B28	0.4 V - 4.6 V	Input	25
20	Power	F16	12 V / 7.5 A	Input	8, 18
21	---	---	---	---	---
22	---	---	---	---	---
23	---	---	---	---	---
24	---	---	---	---	---
25	Reverse front attachment	S57	12 V	Output	17

Module A13 - Performance monitor (DKG)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	---	---	---	---	---
2	Earth (GND)	31	Earth	Input	6
3	CAN high	-	-	-	6
4	---	---	---	---	---
5	Electronic unit	F3	12 V / 1 A	Input	29
6	Right-hand separation signal	B34	-	Input	29
7	---	---	---	---	---
8	---	---	---	---	---
9	---	---	---	---	---
10	---	---	---	---	---
11	---	---	---	---	---
12	---	---	---	---	---
13	---	---	---	---	---
14	---	---	---	---	---
15	---	---	---	---	---
16	CAN low	-	-	-	6
17	Left-hand separation signal	B33	-	Input	29
18	---	---	---	---	---
19	---	---	---	---	---
20	---	---	---	---	---
21	---	---	---	---	---
22	---	---	---	---	---
23	Cleaning signal	B31	-	Input	29
24	---	---	---	---	---
25	---	---	---	---	---

Module A15 - Electronic engine control module CATERPILLAR (CAT)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
5	Cooling water level signal	Z33	#	Input	2a
8	Diagnosis	XM	---	---	2a
9	Diagnosis	XM	---	---	2a
28	Error code	D1	---	Output	2a
34	CAN 2 low (J1939)	---	---	---	2a
42	CAN 2 screening (J1939)	---	---	---	2a
44	Diagnosis LED release	U22	Earth	Input	2a
48	Power	+30	12 V	Input	2a
50	CAN 2 high (J1939)	-	-	-	2a
52	Power	+30	12 V	Input	2a
53	Power	+30	12 V	Input	2a
54	Cooling water level power supply	Z33	#	Input	2a
61	Earth	-31	Earth	Input	2a
63	Earth	-31	Earth	Input	2a
64	Electric starting motor power (terminal 50)	---	12 V	Input	1a, 2a
65	Earth	-31	Earth	Input	2a
70	Power +15	F34	12 V/20 A	Input	1a, 2a

Module A15 - Electronic engine control module DAIMLER-CHRYSLER (DC)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
X1/ 1	CAN-H	---	---	---	2b
X1/ 2	CAN-L	---	---	---	2b
X1/ 3	HF-GND	---	---	---	2b
X1/ 4	HF-GND	---	---	---	2b
X1/ 5	Power 12 V	---	12 V	Input	2b
X1/ 6	Power 12 V	---	12 V	Input	2b
X1/ 8	Electric starting motor power (terminal 50)	---	12 V	Input	1a, 2b
X1/ 9	Earth	---	0 V	Input	2b
X1/11	Earth	---	0 V	Input	2b
X1/13	Diagnosis	DM	---	---	2b
X1/15	12 V power (terminal 15)	---	12 V	Input	2b

Module A17 - Engine adaptation module ADM DAIMLER-CHRYSLER (DC)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1/01	Power input 12 V (terminal 30)	---	12 V	Input	2b
1/02	Power input 12 V (terminal 15)	---	12 V	Input	2b
1/03	Earth	---	0 V	Input	2b
1/19	CAN 2 high (J1939)	---	---	---	2b
1/20	CAN 2 screening (J1939)	---	---	---	2b
1/21	CAN 2 low (J1939)	---	---	---	2b
3/13	CAN-LH (J 1939)	---	---	---	2b
3/14	CAN-HF-GND (J 1939)	---	---	---	2b
3/15	CAN-LL (J 1939)	---	---	---	2b
4/02	Diagnosis	---	---	---	2b

Module A16 – Reel controller

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Raise reel	Y22	12 V	Output	21
2	Earth (GND)	32	Earth	Input	6
3	CAN high	-	-	-	6
4	Front attachment reverse signal	S57	12 V	Input	17
5	Reel speed signal	B17	0.4 V – 4.6 V	Input	22
6	---	---	---	---	---
7	---	---	---	---	---
8	Reference voltage	---	5 V	Output	---
9	---	---	---	---	---
10	Snapping plates actual value signal	B55	0.25-4.75 V	Input	21
11	---	---	---	---	---
12	Front attachment dampening	Y97	12 V	Output	31
13	Reel speed -	Y96	12 V	Output	22
14	Lower reel	Y23	12 V	Output	21
15	Electronic unit	F8	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	Cutterbar identification signal	F49	12 V	Input	22
18	Power	F26	12 V / 15 A	Input	21, 22, 31
19	---	---	---	---	---
20	Power	F26	12 V / 15 A	Input	21, 22, 31
21	Reel height actual value signal	B39	0.25-4.75 V	Input	24
22	Variable displacement pump actual value signal	B73	0.25-4.75 V	Input	22
23	---	---	---	---	---
24	---	---	---	---	---
25	Reel speed +	Y95	12 V	Output	22

Module A21 - Yield meter

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Sample-taking slide	Y52	12 V	Output	27
2	Earth (GND)	31	Earth	Input	6
3	CAN high	-	-	-	6
4	---	---	---	---	---
5	Yield signal	B59	1.2 V / >2.5 V	Input	27
6	---	---	---	---	---
7	---	---	---	---	---
8	---	---	---	---	---
9	---	---	---	---	---
10	Longitudinal inclination actual value signal	B62	1.2-4.8 V	Input	27
11	Moisture + signal	B61	---	Input	27
12	---	---	---	---	---
13	---	---	---	---	---
14	---	---	---	---	---
15	Electronic unit	F9	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	Returns signal	B75	1.2 V / >2.5 V	Input	27
19	---	---	---	---	---
20	Power	F10	12 V / 10 A	Input	27
21	Moisture - signal	B61	---	Input	27
22	Moisture temperature signal	B61	---	Input	27
23	Lateral inclination actual value signal	B62	1.2-4.8 V	Input	27
24	---	---	---	---	---
25	---	---	---	---	---

Module A25 - Sieve adjustment

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Open upper sieve	K42/86	12 V	Output	11
2	Earth (GND)	31	Earth	Input	6, 11
3	CAN high	-	-	-	6
4	---	---	---	---	---
5	---	---	---	---	---
6	---	---	---	---	---
7	---	---	---	---	---
8	Sieve adjustment reference voltage	R37, R38	5 V	Output	11
9	---	---	---	---	---
10	---	---	---	---	---
11	---	---	---	---	---
12	Close upper sieve	K41/86	12 V	Output	11
13	Open lower sieve	K44/86	12 V	Output	11
14	Close lower sieve	K43/86	12 V	Output	11
15	Electronic unit	F2	12 V / 3 A	Input	6, 11
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	---	---	---	---	---
19	---	---	---	---	---
20	Power	F2	12 V / 3 A	Input	11
21	---	---	---	---	---
22	Upper sieve actual value signal	R37	0.25-4.75 V	Input	11
23	Lower sieve actual value signal	R38	0.25-4.75 V	Input	11
24	---	---	---	---	---
25	---	---	---	---	---

Module A27 - VARIO

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Reel forward	Y24	12 V	Output	21
2	Earth (GND)	-31	Earth	Input	6
3	CAN high	-	-	-	6
4	Reel limit switch signal	Z64	12 V	Input	21
5	---	---	---	---	---
6	---	---	---	---	---
7	---	---	---	---	---
8	Reference voltage	---	5 V	Output	---
9	---	---	---	---	---
10	---	---	---	---	---
11	---	---	---	---	---
12	Reel backward	Y25	12 V	Output	21
13	Table adjustment forward	K9	12 V	Output	23
14	Table adjustment backward	K10	12 V	Output	23
15	Electronic unit	F49	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	Cutting table end signal	Z65	12 V	Input	23
18	---	---	---	---	---
19	---	---	---	---	---
20	Power	F49	12 V / 15 A	Input	23
21	---	---	---	---	---
22	Reel horizontal actual value signal	B40	0.25-4.75 V	Input	24
23	Cutting table actual value signal	B70	0.25-4.75 V	Input	24
24	---	---	---	---	---
25	---	---	---	---	---

Module A28 - Uni-spreader (VGS)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	---	---	---	---	---
2	Earth (GND)	-31	Earth	Input	6
3	CAN high	-	-	-	6
4	---	---	---	---	---
5	---	---	---	---	---
6	---	---	---	---	---
7	Chopper circuit signal	Z59	12 V	---	13, 19
8	Reference voltage	---	5 V	Output	13
9	---	---	---	---	---
10	---	---	---	---	---
11	Swivel position actual value signal	B71	0.25-4.75 V	Input	13
12	Swivel to the left	Y83	12 V	Output	13
13	Master valve	Y78	12 V	Output	13
14	---	---	---	---	---
15	Electronic unit	F54	12 V / 1 A	Input	6
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	---	---	---	---	---
19	---	---	---	---	---
20	Power	Z59	12 V / 15 A	Input	13, 19, 20
21	---	---	---	---	---
22	---	---	---	---	---
23	---	---	---	---	---
24	---	---	---	---	---
25	Swivel to the right	Y84	12 V	Output	13

Module A30 – Terminal

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Coolant level float switch	Z33	Earth	Input	2, 5
2	Air filter maintenance switch	Z69	Earth	Input	3, 5
3	Hydraulic oil pressure, level	Z19, Z46	Earth	Input	5, 26
4	Compressor-type air conditioner fault	Z22, Z23	Earth	Input	5, 38
5	Rear axle limit switch, left-hand	Z38	Earth	Input	5, 26
6	Straw walker jammed pushbutton	Z61	Earth	Input	5, 26
7	Grain tank filling level 70% microswitch	Z28	Earth	Input	5, 30
8	Grain tank unloading	Y35	Earth	Input	5, 15
9	Grain tank unloading auger tube position limit switch	Z30	Earth	Input	5, 15
10	CAN low	---	---	---	5, 6
11	Power supply 12 V (+30, K56/87a)	---	12 V	Input	6
12	Power supply 12 V (+30, K56/87a)	---	12 V	Input	6
13	Power supply 12 V (+30, K56/87a)	---	12 V	Input	6
14	---	---	---	---	---
15	Hydraulic oil temperature switch	Z20, B123	Earth	Input	5, 26
16	Parking brake switch	Z12	Earth	Input	5, 26
17	Brake circuit pressure	Z79, Z80	12 V	Input	5, 44
18	Rear axle limit switch, right-hand	Z39	Earth	Input	5, 26
19	Straw chopper position limit switch	Z58	12 V	Input	5, 19
20	Grain tank filling level 100% microswitch	Z27	Earth	Input	5, 30
21	Grain tank extension position limit switch	Z29	Earth	Input	5, 30
22	CAN high	---	---	---	5
23	Earth	---	Earth	Input	5
24	Earth	---	Earth	Input	5
25	Earth	---	Earth	Input	5

Module A33 – Sidefinder

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
2 L	Sidefinder, left-hand	E71	12 V	Output	48
4 L	Power supply	F61	12 V	Input	36
5 L	Dipped lights	K55	12 V	Output	48
6 L	Earth	-31	Earth	Input	36
8 L	Sidefinder, right-hand	E72	12 V	Output	48
2 R	Turn flasher, left-hand	S16	12 V	Input	36
4 R	Turn flasher, right-hand	S16	12 V	Input	36
5 R	Ignition	+15	12 V	Input	48
6 R	Lights main switch	S17	12 V	Input	48
8 R	Ignition / road travel	F15	12 V	Input	48

Module A34 – Grain tank

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
2 l	Swing in grain tank unloading tube	Y34	12 V	Output	14
4 l	+12V	F37	12 V	Input	14
5 l	Swing out grain tank unloading tube	Y33	12 V	Output	14
6 l	Earth	-31	Earth	Input	14
8 l	Grain tank unloading ON	Y35	12 V	Output	15
2 r	Seat contact	Z5	12 V	Input	15, 17
4 r	Grain tank unloading tube swung out	Z30	Earth	Input	15
5 r	Swing in grain tank unloading tube	S88	Earth	Input	14
6 r	Swing out grain tank unloading tube	S87	Earth	Input	14
8 r	Grain tank unloading ON	S31	Earth	Input	48

Module A35 – Montana 570-520 control unit - with external MONTANA control unit
(up to serial no. 582 00051, 581 00026; 580 00028)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Power supply (K69)	---	12 V	Input	41s, 4s
2	Lower axle, left-hand side	Y114	12 V	Output	41s
3	Raise axle, right-hand side	Y115	12 V	Output	41s
4	Raise axle, right-hand side	Y117	12 V	Output	41s
5	Lower axle, right-hand side	Y116	12 V	Output	41s
6	Rotate front attachment to the left	Y113	12 V	Output	41s
7	Rotate front attachment to the right	Y112	12 V	Output	41s
8	Raise cutting angle	Y110	12 V	Output	41s
9	Lower cutting angle	Y111	12 V	Output	41s
10	Master valve (Montana)	Y128	12 V	Output	4s
11	Master valve (Working hydraulics)	Y77, Y128	12 V	Output	4s
12	Oil quantity increase	Y118	12 V	Output	41s
13	not used	---	---	---	---
14	Earth	---	Earth	Input	41s
15	Power supply (K69)	---	12 V	Input	41s, 4s
16	Left-hand axle angle sensor signal	B91	0.25-4.75 V	Input	41s
17	Montana cross levelling sensor signal	B94	0.25-4.75 V	Input	41s
18	not used	---	---	---	---
19	not used	---	---	---	---
20	not used	---	---	---	---
21	CAN Low (Inclinometer)	B126-1	-	Output	41s
22	not used	---	---	---	---
23	CAN Low (Montana)	A41	-	Output	06s
24	Earth	A41	Earth	Output	06s
25	RS 232	---	---	---	06s
26	RS 232	---	---	---	06s
27	not used	---	---	---	---
28	Earth	---	Earth	Input	41s
29	Power supply (K69)	---	12V	Input	41s, 4s
30	Right-hand axle angle sensor signal	B92	0.25-4.75 V	Input	41s
31	Cutting angle sensor signal	B93	0.25-4.75 V	Input	41s
32	Parking brake signal	S93	12 V	Input	41s
33	Earth sensors	B91, B92, B93, B94, B95, B126	Earth	Output	41s
34	not used	---	---	---	---
35	not used	---	---	---	---
36	CAN High (Inclinometer)	B126	-	Output	41s
37	Power supply (CAN)	A41	12 V	Output	06s
38	CAN High (Montana)	A41	-	Output	06s
39	RS 232 (Boot)	---	---	---	06s
40	RS 232	---	---	---	06s
41	not used	---	---	---	---
42	not used	---	---	---	---

Module A36 – Montana 570-520 gearshift module - with external MONTANA control unit
(up to serial no. 582 00051, 581 00026; 580 00028)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Earth	---	Earth	Input	42s
2	Power supply (+15)	K56	12 V	Input	42s
3	Gearbox shifting release	S90	12 V	Output	42s
4	2nd gear signal	Z83	12 V	Input	42s
5	1st gear signal	Z82	12 V	Input	42s
6	Gearbox shift 1st gear	Y107	12 V	Output	42s
7	Gearbox shift 2nd gear	Y108	12 V	Output	42s
8	not used	---	---	---	---
9	Ground drive control pressure circuit SH	Y125	12 V	Output	42s
10	Engine speed maximum reduced	---	12 V - 1st gear 0 V - 2nd gear	Output	42s, 2s
11	Engine speed (Gearshift control)	---	12 V	Input	42s, 2s
12	Parking brake circuit	Y123	12 V	Input	42s
13	Shifting aid uphill signal	Y121	12 V	Input	42s
14	Shifting aid downhill signal	Y122	12 V	Input	42s
15	Montana master valve gear	Y77	12 V	Output	4s
16	Working hydraulics master valve gear	Y77	12 V	Output	4s
17	Montana master valve gear	Y128	12 V	Output	4s
18	Montana master valve gear	Y128	12 V	Input	4s
19	not used	---	---	---	---
20	Working hydraulics master valve gear	Y77	12 V	Input	4s
21	not used	---	---	---	---
22	not used	---	---	---	---
23	Working hydraulics master valve gear	Y77	12 V	Input	4s
24	Shifting aid gear	Y121; Y122	12 V	Output	42s
25	Ground speed control lever signal neutral	Z57	Earth	Input	1s, 42s

Module A37 – Electro-hydraulic gearshift (EHS) - 3-speed manual gearbox

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	1st gear	Y107	12 V	Output	44
2	GND	-31	Earth	Input	44
3	CAN high	-	-	-	6
4	2nd gear	Y108	12 V	Output	44
5	3rd gear	Y123	12 V	Output	44
6	Master valve	Y77	12 V	Output	4, 44
7	Ground speed control lever neutral	Z57	12 V	Input	1, 44
8	Gearbox power supply actual value switch	Z82, Z83, Z95, Z96, Z97	12 V, limited to 200 mA	Output	44
9	Brake circuit pressure	Z79,Z80	12 V	Input	44
10	Gearbox switch 2nd/3rd/neutral	Z97	12 V	Input	44
11	1st gear engaged gearbox switch	Z82	12 V	Input	44
12	2nd gear engaged gearbox switch	Z83	12 V	Input	44
13	3rd gear engaged gearbox switch	Z95	12 V	Input	44
14	Gearbox neutral signal	H63	12 V	Output	44
15	Electronic unit +	F17	12 V	Input	6
16	CAN low	-	-	-	6
17	1st gear / neutral gearbox switch	Z96	12 V	Input	44
18	1st gear engaged signal	H60	12 V	Output	44
19	2nd gear engaged signal	H61	12 V	Output	44
20	Power	F75	12 V / 15 A	Input	44
21	Gear selection 1st/2nd gear	S70	12 V	Input	44
22	Gear selection 1st/2nd gear	S70	12 V	Input	44
23	Gear selection 3rd gear / neutral	S71	12 V	Input	44
24	Gear selection 3rd gear / neutral	S71	12 V	Input	44
25	3rd gear engaged signal	H62	12 V	Output	44

Module A37 – Electro-hydraulic gearshift (EHS) - 2-speed manual gearbox

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	1st gear	Y107	12V	Output	44
2	GND	-31	Earth	Input	44
3	CAN high	-	-	-	6
4	2nd gear	Y108	12V	Output	44
5	---	---	---	---	---
6	Master valve	Y77	12V	Output	4,44
7	EHS release signal (gearshift release)	A49	12V	Input	1,44
8	Gearbox actual value switch power supply	Z82,Z83, Z96	12V, limited to 200mA	Output	44
9	EHS release signal (gearshift release)	A49	12V	Input	1,44
10	---	---	---	---	---
11	1st gear engaged gearbox switch	Z82	12V	Input	44
12	2nd gear engaged gearbox switch	Z83	12V	Input	44
13	---	---	---	---	---
14	Gearbox neutral signal	H63	12V	Output	44
15	Electronic unit +	F17	12V	Input	6
16	CAN low	-	-	-	6
17	Gearbox switch neutral	Z96	12V	Input	44
18	1st gear engaged signal	H60	12V	Output	44
19	2nd gear engaged signal	H61	12V	Output	44
20	Power	F75	12V / 15A	Input	44
21	Gear selection 1st/2nd gear	S70	12V	Input	44
22	Gear selection 1st/2nd gear	S70	12V	Input	44
23	---	---	---	---	---
24	Gear selection neutral	S71	12V	Input	44
25	---	---	---	---	---

Module A38 – Rotor (RIO)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
R0/1	Electronic unit 5 V	B120	5 V	Output	9
R0/2	Electronic unit 12 V	---	12 V	Output	9
R0/3	Output 1	M28	12 V	Output	9
R0/4	Output 3	Y99	12 V	Output	9
R0/5	Output 2	M22	12 V	Output	9
R0/6	Output 4	Y98	12 V	Output	9
R0/7	Sensor 1	B120	0.25-4.75 V	Input	9
R0/8	Sensor 2	---	---	---	---
R0/9	Earth	Y98/Y99	Earth	Output	9
R0/10	Earth	B120	Earth	Output	9
R0/11	Module code 1	---	12V	Input	9
R0/12	Module code 2	---	---	---	---
R0/13	Module code 3	---	---	---	---
R0/14	Module code 4	---	---	---	---
R0/15	Sensor 3	---	---	---	---
R0/16	Sensor 4	---	---	---	---
R1/1	CAN low	-	-	-	6
R1/2	Electronic unit	F17	12 V	Input	6
R1/3	Power	F67	12 V	Input	9
R1/4	CAN high	-	-	-	6
R1/5	Earth	-	Earth	Input	6
R1/6	Earth	-	Earth	Input	6

Module A42 – MONTANA GEN II module - with integrated MONTANA control unit
(from serial no. 582 00052, 581 00027 and 580 00029)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
X1/01	Earth	---	Earth	Input	06t,41t
X1/02	Electronic unit power supply	F17	12V	Input	06t,41t
X1/03	not used	---	---	---	---
X1/04	CLAAS CAN connection	---	---	---	06t
X1/05	CLAAS CAN connection	---	---	---	06t
X1/06	Inclinometer signal (CAN)	B126	---	Input	06t,41t
X1/07	Inclinometer signal (CAN)	B126	---	Input	06t,41t
X1/08	Diagnosis CAN connection	XD2	---	---	06t
X1/09	Diagnosis CAN connection	XD2	---	---	06t
X1/10	not used	---	---	---	---
X1/11	Earth sensors	---	Earth	Input	41t
X1/12	not used	---	---	---	---
X1/13	Earth sensors	---	Earth	Input	41t
X1/14	Earth	---	Earth	Input	04t,06t,41t
X1/15	Earth	---	Earth	Input	04t,06t,41t
X1/16	not used	---	---	---	---
X1/17	Right-hand axle angle sensor signal	B92	0.25-4.75 V	Input	41t
X1/18	Cutting angle sensor signal	B93	0.25-4.75 V	Input	41t
X1/19	Montana cross levelling sensor signal	B94	0.25-4.75 V	Input	41t
X1/20	MONTANA Automatic mode	S85	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/21	Axle position neutral position	S86	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/22	not used	---	---	---	---
X1/23	not used	---	---	---	---
X1/24	not used	---	---	---	---
X1/25	not used	---	---	---	---
X1/26	not used	---	---	---	---
X1/27	not used	---	---	---	---
X1/28	Earth	---	Earth	Input	04t,06t,41t
X1/29	Earth	---	Earth	Input	04t,06t,41t
X1/30	not used	---	---	---	---
X1/31	not used	---	---	---	---
X1/32	Left brake circuit pressure signal	Z79	12V PWM, T signal (U_{bat}/2)	Input	26t
X1/33	Right brake circuit pressure signal	Z80	12V PWM, T signal (U_{bat}/2)	Input	26t
X1/34	Parking brake signal	S93 (Z12)	12V	Input	41t
X1/35	MONTANA manual axle control system	S79	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/36	MONTANA manual front attachment control	S80	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/37	Lower machine/cutting angle	S84	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/38	Raise machine/cutting angle	S83	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/39	Rotate machine/front attachment to the left	S81	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/40	Rotate machine/front attachment to the right	S82	12V PWM, T signal (U_{bat}/2)	Input	41t
X1/41	Left-hand axle angle sensor signal	B91	0,25-4,75 V	Input	41t
X1/42	Earth	---	Earth	Input	04t,06t,41t

Module A45 - Ground drive hydraulic motor brake restrictor (HBM)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	---	---	---	---	---
2	Master valve	Y77	12 V	Output	4
3	CAN high	-	-	-	6
4	Power +15	K51/87	12 V	Input	6
5	Master valve circuit	Y77	12 V	Input	4
6	Earth (GND)	-31	Earth	Input	6
7	---	---	---	---	---
8	Brake restrictor	Y124	12 V	Output	6
9	CAN low	-	-	-	6

Module A46 – Deflector adjustment (RIO)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
R0/1	Electronic unit 5 V	R28	5 V	Output	12
R0/2	Electronic unit 12 V	---	12 V	Output	12
R0/3	Output 1	M22	12 V	Output	12
R0/4	Output 3	---	---	---	---
R0/5	Output 2	M22	12 V	Output	12
R0/6	Output 4	---	---	---	---
R0/7	Sensor 1	R28	0.25-4.75 V	Input	12
R0/8	Sensor 2	---	---	---	---
R0/9	Earth	---	---	---	---
R0/10	Earth	---	---	---	---
R0/11	Module code 1	---	12 V	Input	12
R0/12	Module code 2	---	12 V	Input	12
R0/13	Module code 3	---	---	---	---
R0/14	Module code 4	---	---	---	---
R0/15	Sensor 3	---	---	---	---
R0/16	Sensor 4	---	---	---	---
R1/1	CAN low	-	-	-	6
R1/2	Electronic unit	F17	12 V	Input	6
R1/3	Power	F66	12 V	Input	12
R1/4	CAN high	-	-	-	6
R1/5	Earth	-	Earth	Input	6
R1/6	Earth	-	Earth	Input	6

Module A49 – Ground drive (EFA)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Sensor earth	B97, B98, R39	0V (200mA)	Output	43
2	Road travel (red)	S52	12V	Input	4, 43
3	4-Trac (All-wheel drive) ON	S1	12V	Input	32
4	Reel speed controller ON/OFF	S123	12V	Input	43
5	Brake light and diesel engine contol unit	Z84, Z85	12V	Input	43
6	Ground drive forward	Y141	12V (PWM)	Output	43
7	---	---	---	---	---
8	Reference - PWM	Y141	~ 0V	Input	43
9	Reference - PWM	Y144	~ 0V	Input	43
10	---	---	---	---	---
11	---	---	---	---	---
12	---	---	---	---	---
13	RS232 GND (Diagnosis EFA)	X97	---	---	43
14	Sensors reference voltage	R39, B99	5V	Output	43
15	Earth supply	-31	Earth	Input	6
16	Hydraulic motor speed 1	B99	High-Low (+)	Input	43
17	Hydraulic motor speed 2	B99	High-Low (+)	Input	43
18	Service brake left / right 25 bar signal	Z79-2,Z80-2	12V	Input	43
19	Safety start switch / Ground speed control lever neutral signal	Z57	12V	Input	1
20	RS232 TxD (Diagnosis EFA)	X97	---	---	43
21	RS232 RxD (Diagnosis EFA)	X97	---	---	43
22	Ground drive shut-off valve (emergency brake) 80 bar	Y143, Z79-1, Z80-1	12V	Output	43
23	Reference - PWM	Y142	~ 0V	Input	43
24	---	---	---	---	---
25	Reference - PWM	Y143	~ 0V	Input	43
26					
27	Ground drive variable displacement motor	Y144	12V (PWM)	Output	43
28	Supply voltage	F75	12V	Input	4, 6, 43
29	Earth supply	-31	Earth	Input	6
30	---	---	---	---	---
31	Ground speed control lever position I	R39	0.7V - 4.8V	Input	43
32	Ground speed control lever position II (inverted, redundant)	R39	4.8V – 0.7V	Input	43
33	---	---	---	---	---
34	---	---	---	---	---
35	Ground drive hydraulics forward high-pressure sensor	B97	0.25-4.75V	Input	43
36	Ground drive hydraulics backward high-pressure sensor	B98	0.25-4.75V	Input	43
37	CAN high (J1939)	---	---	---	6
38	CAN low (J1939)	---	---	---	6
39	CAN GND (J1939)	---	---	---	6
40	Brake light (ground speed control lever)	K66	12V	Output	49
41	EHS release	A37	12V	Output	44
42	Supply voltage	F75	12V	Input	4, 6, 43

Module A51 – Radial spreader

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Power	F66	12 V	Input	13 / 19
2	Earth (GND)	-31	Earth	Input	6
3	---	---	---	---	---
4	Swing in right radial spreader deflector	Y177	12 V (PWM)	Output	13
5	Transport position	Y174	12 V	Output	19
6	Radial spreader deflector drive ON/OFF	Y179	12 V	Output	13
7	---	---	---	---	---
8	---	---	---	---	---
9	---	---	---	---	---
10	Working position /swathing position	U13	12 V	Input	19
11	Straw chopper deflector position (swathing)	Z59	12 V	Input	19
12					
13	Electronic unit +	F17	12 V	Input	6
14					
15	Radial spreader working/transport position	Y185	12 V	Output	19
16	Swing out right radial spreader deflector	Y178	12 V (PWM)	Output	13
17	---	---	---	---	---
18	---	---	---	---	---
19	---	---	---	---	---
20	---	---	---	---	---
21	---	---	---	---	---
22	---	---	---	---	---
23	Straw chopper (radial spreader) in transport position	Z60	12 V	Input	19
24	not used	---	---	---	---
25	not used	---	---	---	---
26	not used	---	---	---	---
27	Power	F66	12 V	Input	13 / 19
28	Earth (GND)	-31	Earth	Input	6
29	Radial spreader swathing position	Y184	12 V	Output	19
30	Swing out left radial spreader deflector	Y176	12 V (PWM)	Output	13
31	Swing in left radial spreader deflector	Y175	12 V (PWM)	Output	13
32	---	---	---	---	---
33	---	---	---	---	---
34	---	---	---	---	---
35	Deflector position sensor signal	B129.1	0.25-4.75 V	Input	13
36	---	---	---	---	---
37	Deflector drive ON / working position	Z58	12 V	Input	19
38	Electronics earth	B129.1	0 V	Output	13
39	CAN low	-	-	-	6
40	CAN high	-	-	-	6
41	Electronic unit +	F17	12 V	Input	6
42	Electronic unit +	F17	12 V	Input	6
43	---	---	---	---	---
45	---	---	---	---	---
46	Deflector position sensor signal	B129	0.25-4.75 V	Input	13
47	---	---	---	---	---
48	Transport position	U14	12 V	Input	19
49	Electronics earth	B129	0 V	Output	13
50	---	---	---	---	---
51	---	---	---	---	---
52	---	---	---	---	---

Module A65 - GPS pilot terminal

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	---	---	---	---	---
2	---	---	---	---	---
3	---	---	---	---	---
4	---	---	---	---	---
5	---	---	---	---	---
6	---	---	---	---	---
7	---	---	---	---	---
8	---	---	---	---	---
9	---	---	---	---	---
10	---	---	---	---	---
11	---	---	---	---	---
12	---	---	---	---	---
13	CAN 1 low	-	-	-	6
14	Electronic unit	F32	12V / 1A	Input	6
15	---	---	---	---	---
16	---	---	---	---	---
17	---	---	---	---	---
18	---	---	---	---	---
19	---	---	---	---	---
20	---	---	---	---	---
21	---	---	---	---	---
22	---	---	---	---	---
23	---	---	---	---	---
24	---	---	---	---	---
25	---	---	---	---	---
26	---	---	---	---	---
27	CAN 2 high (J1939)	-	-	-	-
28	Earth (GND)	-31	Earth	Input	6
29	---	---	---	---	---
30	---	---	---	---	---
31	---	---	---	---	---
32	---	---	---	---	---
33	---	---	---	---	---
34	---	---	---	---	---
35	---	---	---	---	---
36	---	---	---	---	---
37	---	---	---	---	---
38	---	---	---	---	---
39	---	---	---	---	---
40	CAN 1 high	---	---	---	6
41	CAN 2 low (J1939)	---	---	---	2
42	---	---	---	---	---

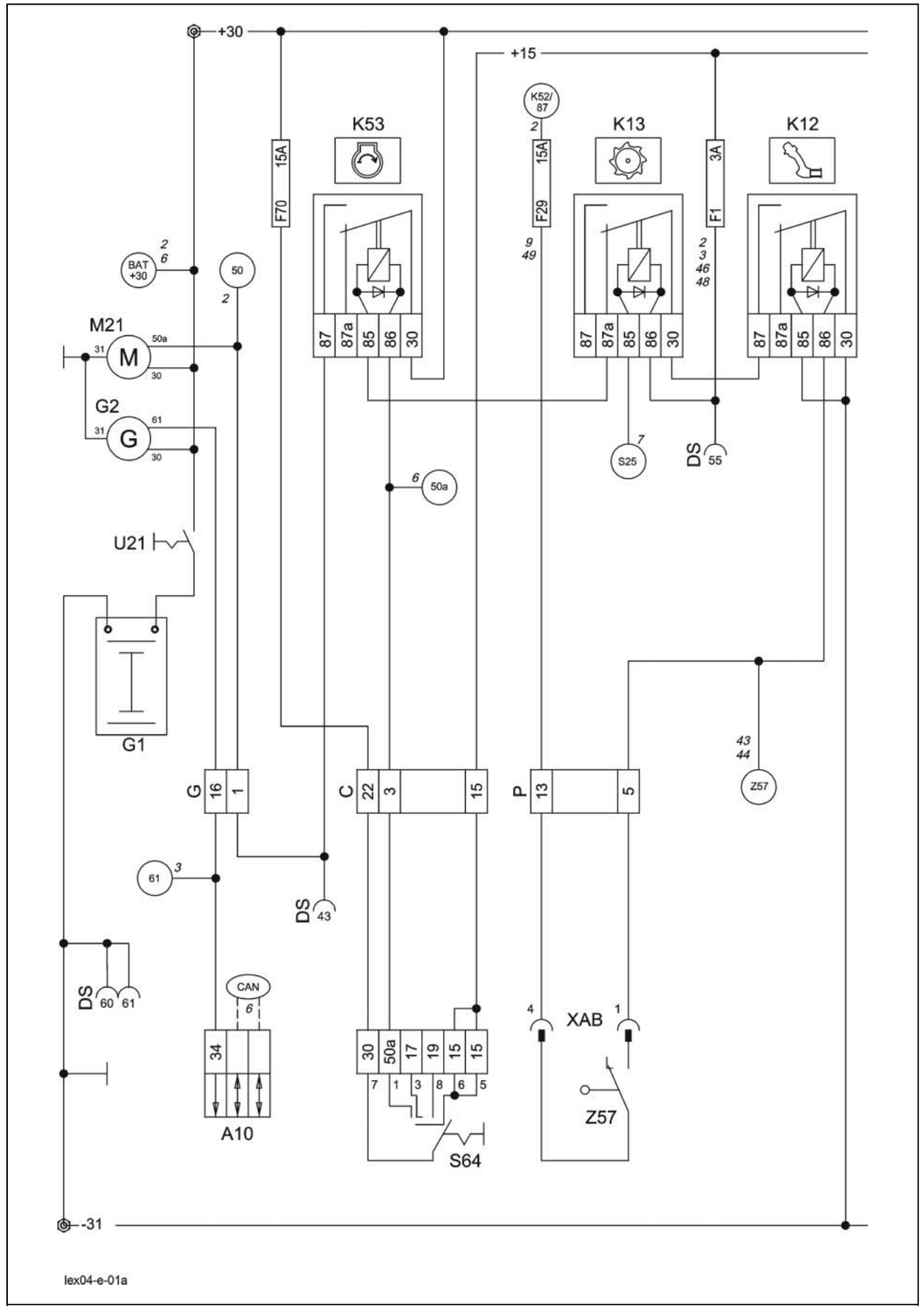
Module A66 - GPS pilot module (GPB)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
X1 – 1	Electronic unit	F32	12V / 1A	Input	6
X1 – 2	Earth (GND)	-31	Earth	Input	6
X1 – 3	CAN 2 high (J1939)	-	-	-	6
X1 – 4	CAN 2 low (J1939)	-	-	-	6
X1 – 5	CAN 1 high	-	-	-	6
X1 – 6	CAN 1 low	-	-	-	6
X1 – 7	Canterm	-	-	-	-
X2 – 1	NC	---	---	---	---
X2 – 2	RS232B_RX	---	---	---	---
X2 – 3	RS232B_TX	---	---	---	---
X2 – 4	NC	---	---	---	---
X2 – 5	COM_GND	---	---	---	---
X2 – 6	NC	---	---	---	---
X2 – 7	NC	---	---	---	---
X2 – 8	NC	---	---	---	---
X2 – 9	PROGRAM ENABLE	---	---	---	---

01a

Main power supply,
diesel engine electric starting motor

01a Main power supply, diesel engine electric starting motor



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
G1	Battery	7-o-20
G2	Alternator	3-q-18
K12	Ground speed control lever neutral position relay	4-i-20
K13	Threshing mechanism relay	4-i-20
K52	Power supply relay	4-i-20
K53	Start relay	4-i-20
M21	Electric starting motor	3-o-17
S25	Main drive switch (threshing mechanism clutch)	3-h-17
S64	Ignition lock switch	3-g-18
U21	Battery isolating switch	7-o-20
Z57	Ground speed control lever neutral position actual value switch - safety start switch	3-h-17

Measured value table:

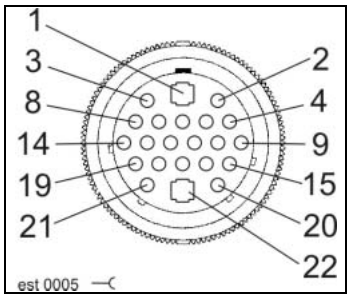
Item	Component	Measured value	Remark
K12 K13	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K53	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

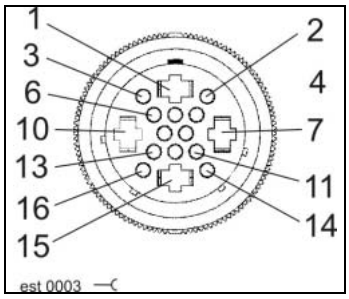
Diesel engine electric starting motor	As a safety start switch, relay K53 is supplied with earth only when switch (Z57) on the ground speed control lever is in neutral position, K12 is switching and the threshing mechanism relay K13 is de-energized. The ignition lock (S64) then actuates the diesel engine starting motor (M21) via relay K53 with +50a.

Connector pin definition:

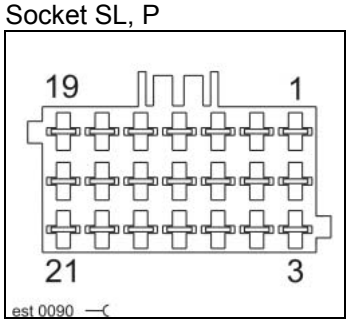
Socket C



Socket G



Socket SL, P



Interconnection list:

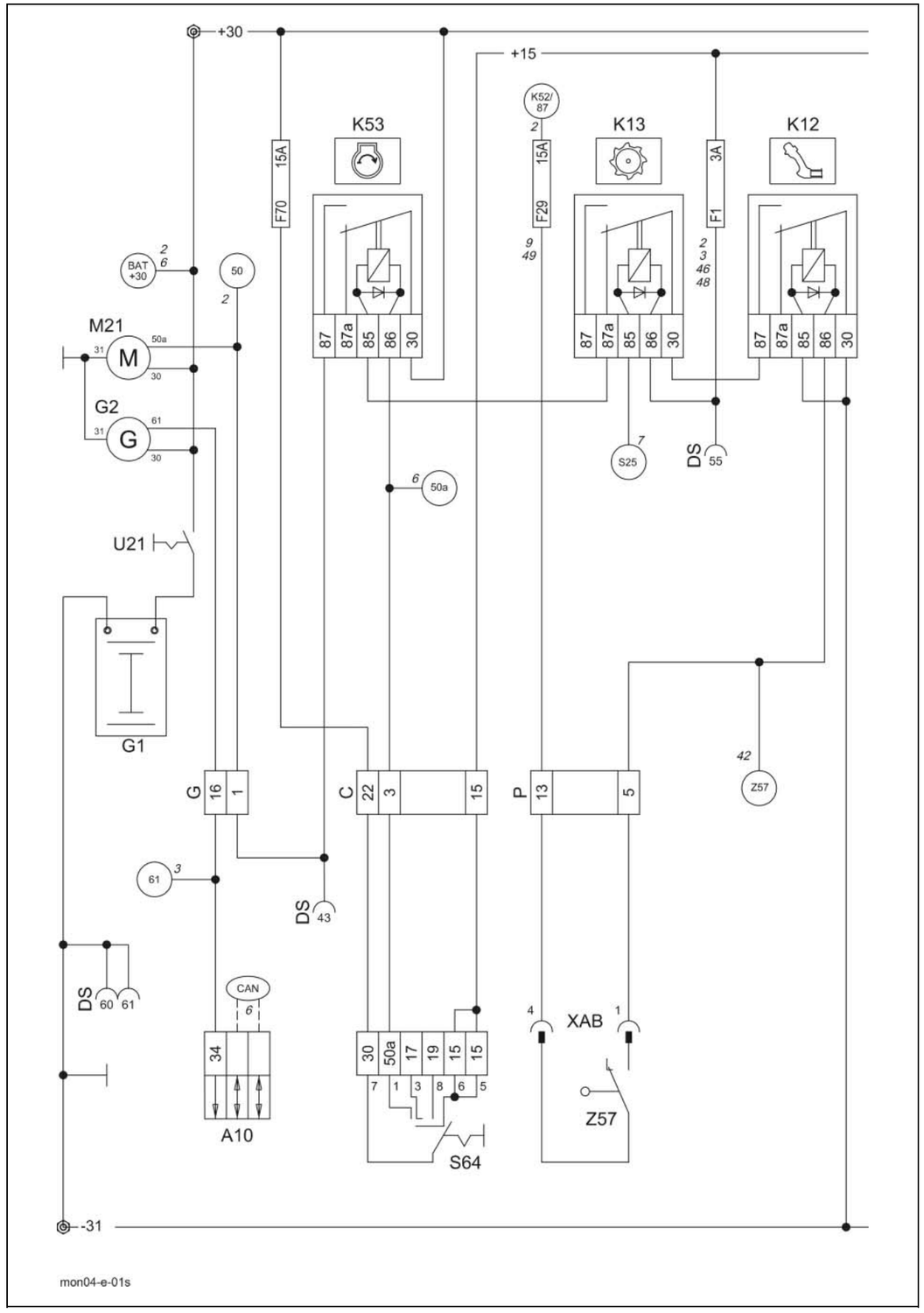
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 3	K53 86	K56 86				0.75	bk-ye
C 15	F01 e	F15 e				1.5	bk
C 22	F70 a					6.0	rd
G 1	K53 87	DS 43				4.0	bk-ye
G 16	C 18	A10 34	K58 86	MM 8		1.0	bl
P 5	K12 86	SL 1				0.75	vi-bl
P13	F29 a					1.5	vi-ye

01s

Main power supply,
Diesel engine electric starting motor

Montana 570-520

01s Main power supply, diesel engine electric starting motor - Montana 570-520



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
G1	Battery	7-o-20
G2	Alternator	3-q-18
K12	Ground speed control lever neutral position relay	4-i-20
K13	Threshing mechanism relay	4-i-20
K52	Power supply relay	4-i-20
K53	Start relay	4-i-20
M21	Electric starting motor	3-o-17
S25	Main drive switch (threshing mechanism clutch)	3-h-17
S64	Ignition lock switch	3-g-18
U21	Battery isolating switch	7-o-20
Z57	Ground speed control lever neutral position actual value switch - safety start switch	3-h-17

Measured value table:

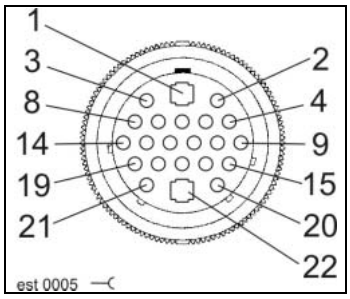
Item	Component	Measured value	Remark
K12 K13	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K53	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

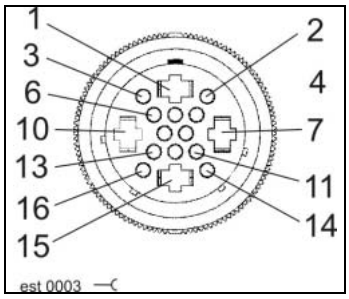
Ground speed control lever	The signal of ground speed control lever in neutral position (Z57) is required on Montana machines for releasing the gear shifting.
Diesel engine electric starting motor	As a safety start switch, relay K53 is supplied with earth only when switch (Z57) on the ground speed control lever is in neutral position, K12 is switching and the threshing mechanism relay K13 is de-energized. The ignition lock (S64) then actuates the diesel engine starting motor (M21) via relay K53 with +50a.

Connector pin definition:

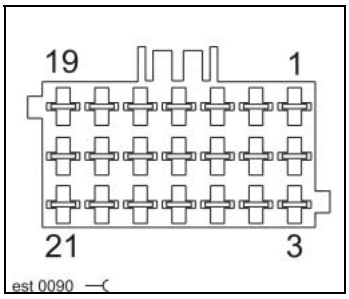
Socket C



Socket G



Socket P



Interconnection list:

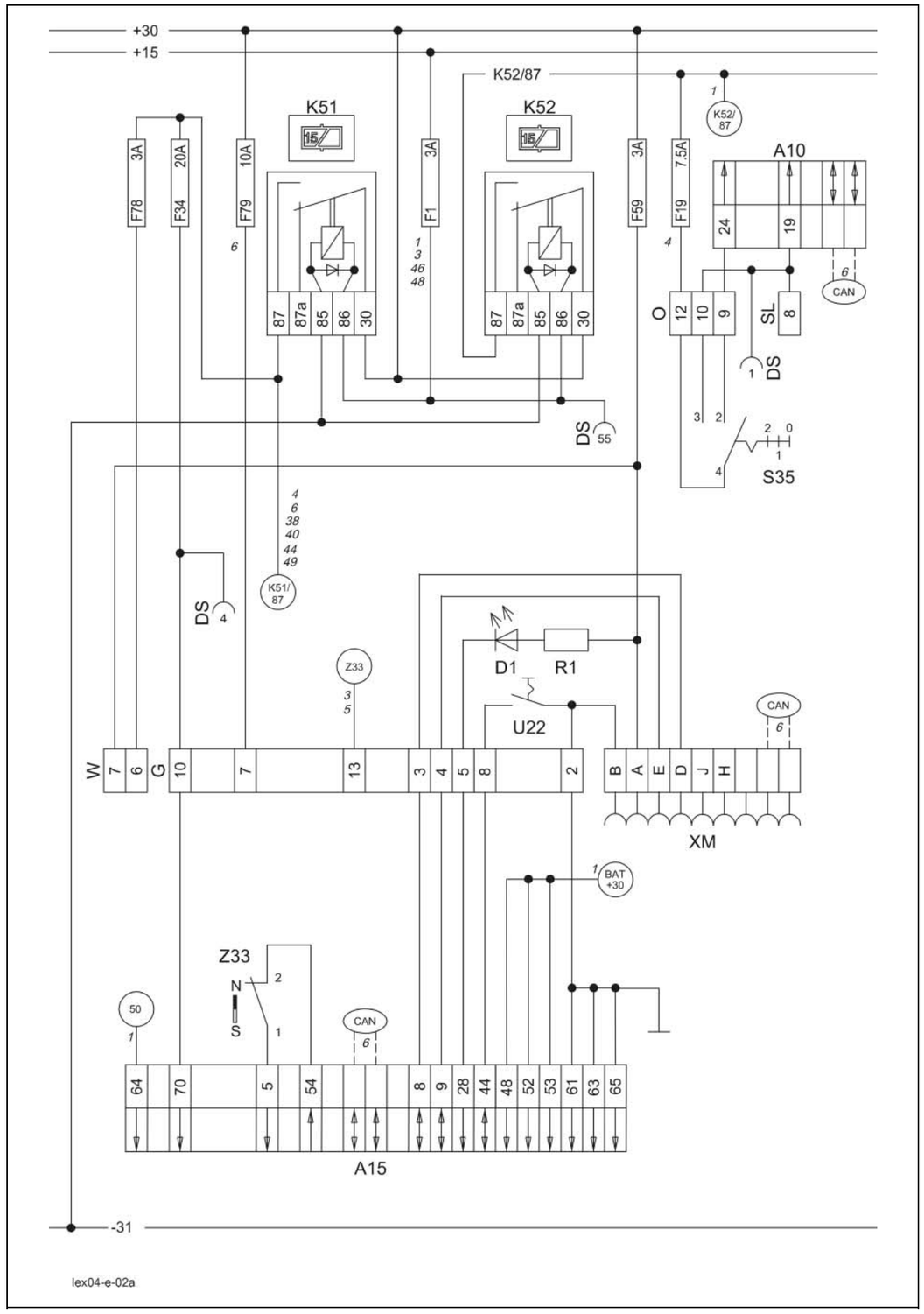
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 3	K53 86	K56 86				0.75	bk-ye
C 15	F01 e	F15 e				1.5	bk
C22	F70 a					6.0	rd
G 1	K53 87	DS 43				4.0	bk-ye
G 16	C 18	A10 34	K58 86	MM 8		1.0	bl
P 5	K12 86	SL 1				0.75	bl-or
P13	F29 a					0.75	bk

02a

Starting the diesel engine, diesel engine electric starting motor

CATERPILLAR -
C12, C10, C9, 3126B

02a Starting the diesel engine, diesel engine electric starting motor - CAT C12, C10, C9, 3126B



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A15	Electronic engine control module	3-p-18
D1	Diesel engine error code LED	3-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
R1	Resistor	3-i-20
S35	Engine speed adjustment switch	3-h-17
U22	Diesel engine diagnosis switch	3-i-20
Z33	Coolant level actual value switch	2-o-17
XM	Caterpillar diagnosis connector	4-i-20

Note: When the coolant level is correct, the coolant level actual value switch Z33 is **closed**!

Measured value table:

Item	Component	Measured value	Remark
K51 K52	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

Starting

The safety start switch circuit of this engine is identical with the one used on the mechanically controlled engines.
The engine controller module (A15) is activated via relay K51 by the ignition lock (S64). During the starting procedure, the engine controller module (A15) receives the speed signal from the sensor provided on the camshaft and starts the injection.

Engine monitoring

All sensors relevant for operation and monitoring of the engine are mounted on the engine wiring loom. Only the water level sensor is connected to the CLAAS wiring loom.
The engine controller module (A15) transmits the signals for displaying the engine speed, coolant level and the coolant temperature to the CAB module (A10) via the CAN bus J1939. The CAN module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.

Engine diagnosis

The number of engine errors occurred and the corresponding error codes can be displayed in the terminal. Further diagnosis is carried out via the diagnosis plug in the central terminal compartment, using the Caterpillar diagnosis tool CAT-ET. The display of error codes can also be activated by the diagnosis LED (D2) after actuating the rocker switch (U22).

Diesel engine speed adjustment

The diesel engine speed depends on the position of switch S35. Three positions are possible, i.e. idle speed, half throttle and full throttle.
When third gear is engaged, gearbox switch Z95 cuts the power supply to the CAB module (A10) and the diesel engine speed is reduced – road travel (see also diagram 44). The maximum speed which can be achieved now is country-specific and can be configured using the Claas diagnosis system CDS.

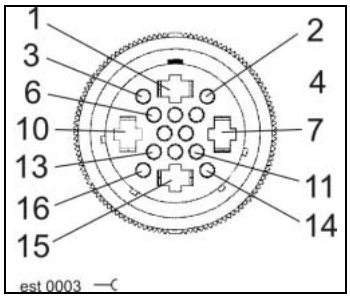
LEXION Type	Idle speed (S35)	Half throttle* (S35)	Full throttle at no load (S35)	20 km/h (Z95)	25 km/h (Z95)
510-530	1200 rpm	1500 rpm	2100 rpm	1522 rpm	1903 rpm
540-570	1200 rpm	1500 rpm	2100 rpm	1568 rpm	1960 rpm
580	1200 rpm	1500 rpm	2080 rpm	1781 rpm	2080 rpm

*- Indicated speed valid only for „Front attachment OFF“.
In case of “Front attachment ON”, the idle speed rpm value is used.

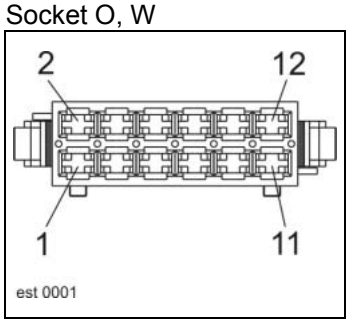
Note: The speeds specified above apply to wheel-equipped machines. Other speeds apply to MTS- or steel track-equipped machines.

Connector pin definition:

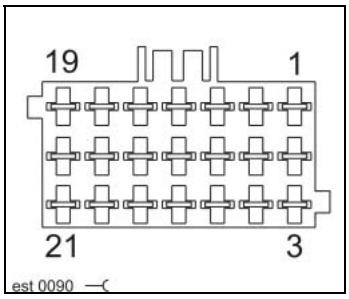
Socket G



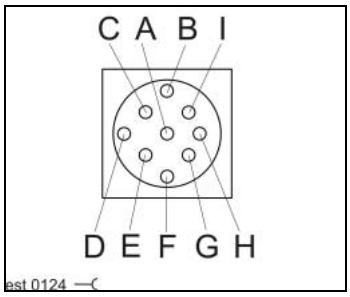
Socket O, W



Socket SL



Socket XM



Interconnection list:

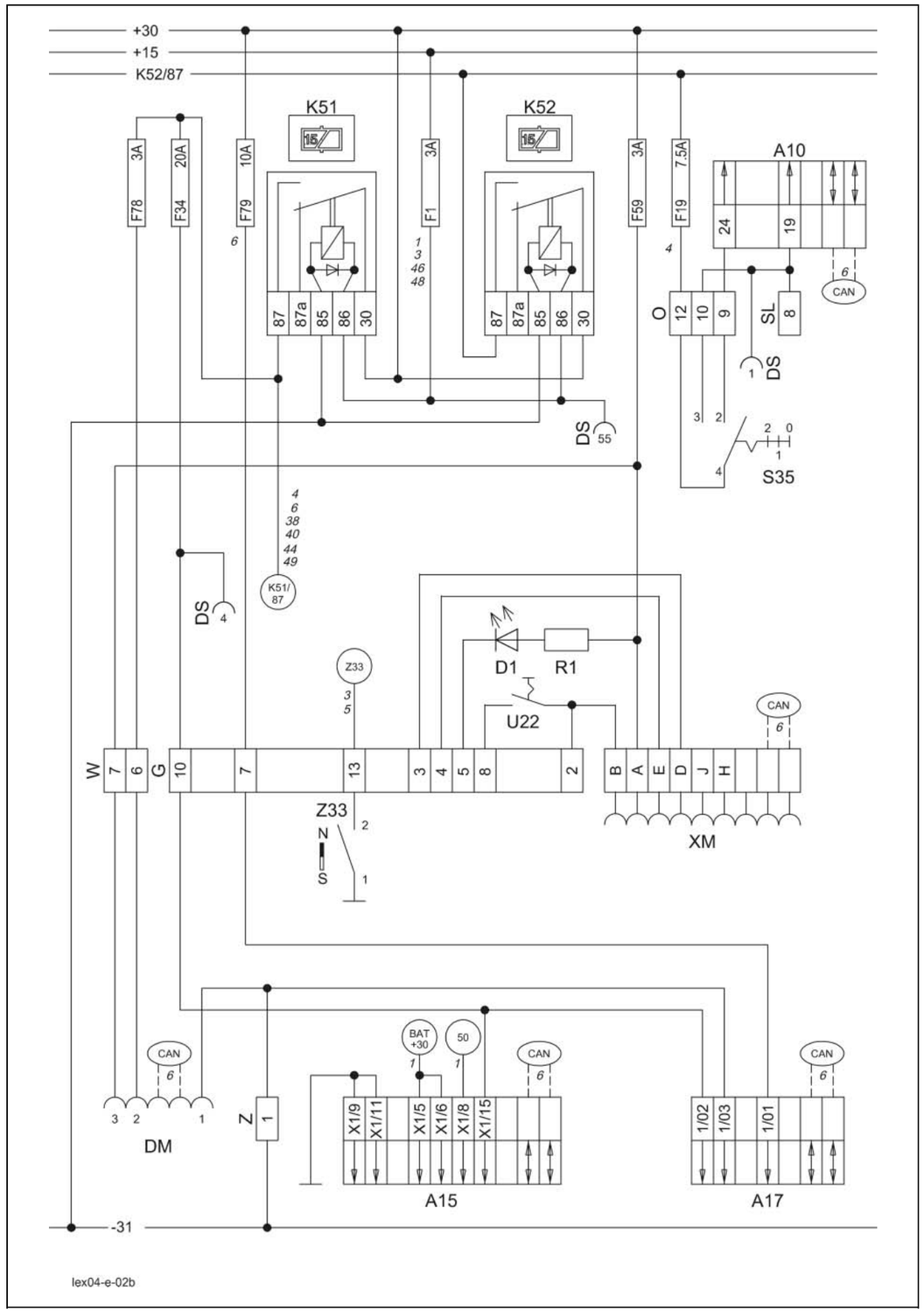
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
G2	SW 1	XM B				1.5	br
G3	XM D					1.0	gn
G4	XM E					1.0	gn-br
G5	SH 2					1.0	wh
G7	F79 a						
G8	SW 2					1.0	ye
G10	F34 a	DS 4	DS 4			1.5	bk
O9	A10 24					1.5	wh-ye
O10	DS 1		A10 19	SL 8		1.5	wh-rd
O12	F19 a					2.5	bk
SL8	O 10	DS 1	A10 19				
W6	F78 a						
W7	F59 a	XM A	SH 1				
XM A	F59 a	SH 1	W 7				
XM B	G 2	SW 1					
XM D	G 3						

2b

Starting the diesel engine, diesel engine electric starting motor

Daimler - Chrysler
DC 502 LA

02b Starting the diesel engine, diesel engine electric starting motor- DC 502 LA



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A15	Electronic engine control module	3-p-18
A17	Engine adaptation module (ADM)	2-i-20
D1	Diesel engine error code LED	3-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
R1	Resistor	3-i-20
S35	Engine speed adjustment switch	3-h-17
U22	Diesel engine diagnosis switch (CAT only)	3-i-20
XM	Caterpillar diagnosis connector	4-i-20
DM	Daimler-Chrysler diagnosis connector	2-i-20
Z33	Coolant level actual value switch	2-o-17

Note: When the coolant level is correct, the coolant level actual value switch Z33 is **closed**!

Measured value table:

Item	Component	Measured value	Remark
K51 K52	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

Starting

The safety start switch circuit of this engine is identical with the one used on the mechanically controlled engines.
The engine controller module (A15) is activated via relay K51 by the ignition lock (S64). During the starting procedure, the engine controller module (A15) receives the speed signal from the sensor provided on the camshaft and starts the injection.

Engine monitoring

All sensors relevant for operation and monitoring of the engine are mounted on the engine wiring loom. Only the water level sensor is connected to the CLAAS wiring loom.
The coolant level monitoring is fully electric. An optical and acoustic warning is given when the diesel engine is **not** running (K23 is not activated – see also diagram 3a).
A lack of coolant during operation makes the engine temperature rise. This temperature in turn is read in and processed as a safety parameter of the diesel engine.
The engine controller module (A15) transmits the signals for displaying the coolant temperature and the engine speed to the CAB module (A10) via the CAN bus J1939. The CAN module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.

Engine diagnosis

The number of engine errors occurred and the corresponding error codes can be displayed in the terminal. Further diagnosis is carried out using the DM diagnosis plug and the Daimler Chrysler diagnosis tool Minidiag.

Diesel engine speed adjustment

The diesel engine speed depends on the position of switch S35. Three positions are possible, i.e. idle speed, half throttle and full throttle.
When third gear is engaged, gearbox switch Z95 cuts the power supply to the CAB module (A10) and the diesel engine speed is reduced – road travel (see also diagram 44). The maximum speed which can be achieved now is country-specific and can be configured using the Claas diagnosis system CDS.

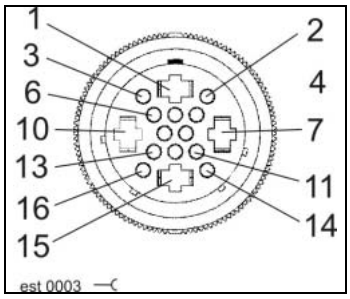
LEXION Type	Idle speed (S35)	Half throttle* (S35)	Full throttle at no load (S35)	20km/h (Z95)	25 km/h (Z95)
510-530	1200 rpm	1500 rpm	2100 rpm	1522 rpm	1903 rpm
540-570	1200 rpm	1500 rpm	2100 rpm	1568 rpm	1960 rpm
580	1200 rpm	1500 rpm	2080 rpm	1781 rpm	2080 rpm

*- Indicated speed valid only for „Front attachment OFF“.
In case of “Front attachment ON”, the idle speed rpm value is used.

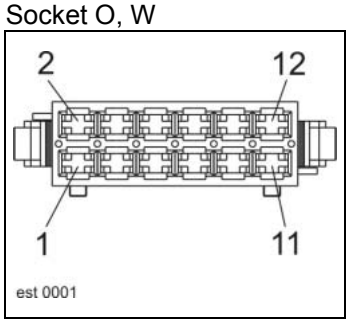
Note: The speeds specified above apply to wheel-equipped machines. Other speeds apply to MTS- or steel track-equipped machines.

Connector pin definition:

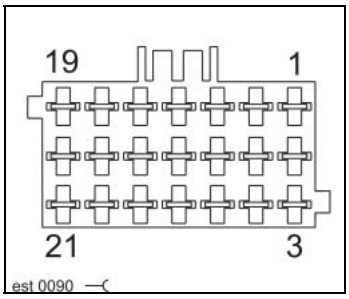
Socket G



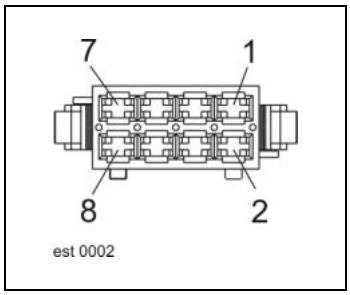
Socket O, W



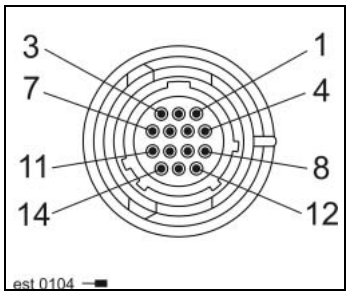
Socket SL



Socket Z



Socket DM



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
G2	SW 1	XM B				#	#
G3	XM D					#	#
G4	XM E					#	#
G5	SH 2					#	#
G7	F79 a					#	#
G8	SW 2					#	#
G10	F34 a	DS 4	DS 4			#	#
O9	A10 24					1.5	wh-ye
O10	DS 1		A10 19	SL 8		1.5	wh-rd
O12						2.5	bk
SL8	O 10	DS 1	A10 19				
W6	F78 a	DM 2				#	#
W7	F59 a	XM A	SH 1	DM 3		#	#
Z1	-31					#	#

02s

Starting the diesel engine, Diesel engine speed adjustment

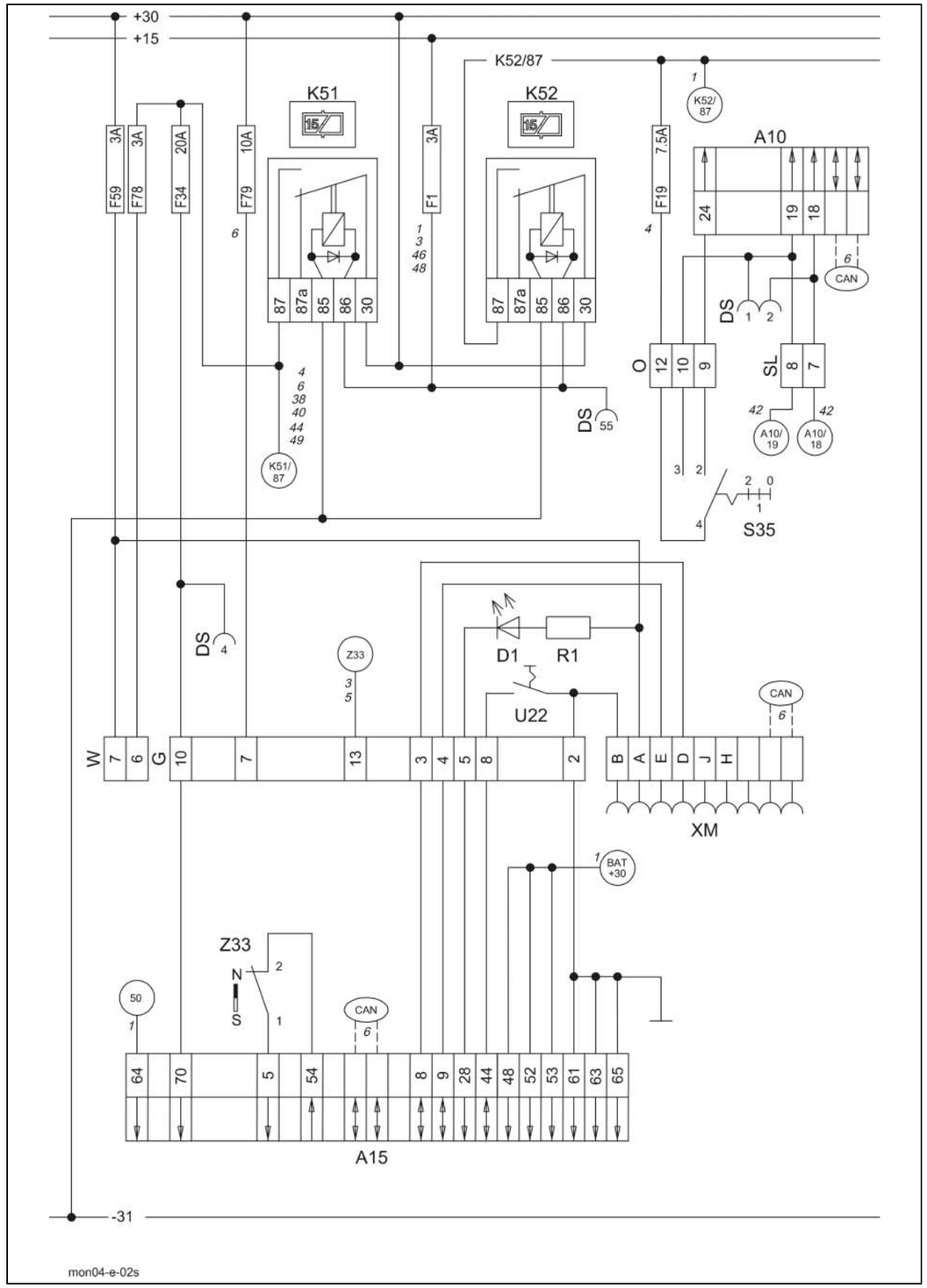
CATERPILLAR -
C12, C10, C9, 3126B

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
581 00026
580 00028

02s Starting the diesel engine, diesel engine speed adjustment
- CAT C12, C10, C9, 3126B, Montana 570-520
- with external MONTANA control unit (up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A15	Electronic engine control module	3-p-18
D1	Diesel engine error code LED	3-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
R1	Resistor	3-i-20
S35	Engine speed adjustment switch	3-h-17
U22	Diesel engine diagnosis switch	3-i-20
Z33	Coolant level actual value switch	2-o-17
XM	Caterpillar diagnosis connector	4-i-20

Note: The coolant level actual value switch Z33 is **closed** when the coolant level has been properly topped up!

Measured value table:

Item	Component	Measured value	Remark
K51 K52	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

Starting

The engine controller module (A15) is activated via relay K51 by the ignition lock (S64). During the starting procedure, the engine controller module (A15) receives the speed signal from the sensor provided on the camshaft and starts the injection.

Engine monitoring

All sensors relevant for operation and monitoring of the engine are mounted on the engine wiring loom. Only the water level sensor is connected to the CLAAS wiring loom.
The engine controller module (A15) transmits the signals for displaying the engine speed, the coolant level and the coolant temperature to the CAB module (A10) via the CAN bus J1939. The CAN module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.

Engine diagnosis

The number of engine errors occurred and the corresponding error codes can be displayed in the terminal. Further diagnosis is carried out via the diagnosis plug in the central terminal compartment, using the Caterpillar diagnosis tool CAT-ET. The display of error codes can also be activated by the diagnosis LED (D2) after actuating the rocker switch (U22).

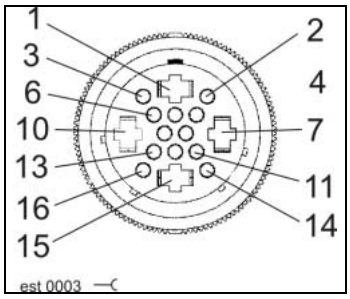
Diesel engine speed adjustment

The diesel engine speed depends on the position of switch S35 and of the 2nd gear actual value switch (Z83) – see also circuit diagram 42s.
If full throttle speed is selected and the 2nd gear engaged (signal input A36 / pin 4), the connection between A10/18 and A10/19 inside the Montana gearshift control module (A36) is cut (pins 10 and 11) – see also circuit diagram 42s.
The full throttle speed is reduced to road travel speed, depending on the country version. The maximum speed which can be achieved now can be configured using the Claas diagnosis system CDS.

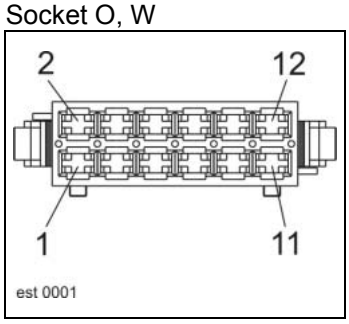
LEXION Type	Idle speed (S35)	Full throttle at no load (S35)	20 km/h (Z83)	25 km/h (Z83)
Montana 570-520	1200 rpm	2100 rpm	1568 rpm	1960 rpm

Connector pin definition:

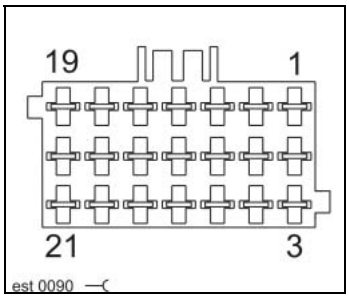
Socket G



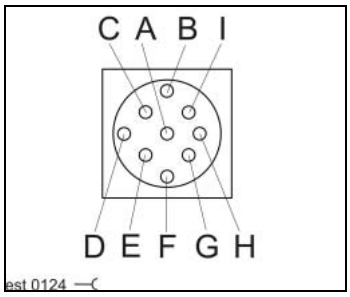
Socket O, W



Socket SL



Socket XM



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
G2	SW 1	XM B				1.5	br
G3	XM D					1.0	gn
G4	XM E					1.0	gn-br
G5	SH 2					1.0	wh
G8	SW 2					1.0	ye
G10	F34 a	DS 4	DS 4			1.5	bk
O9	A10 24					1.5	wh-ye
O10	DS 1		A10 19	SL 8		1.5	wh-rd
O12	F19 a					2.5	bk
SL7						1.0	vi-bk
SL8	O 10	DS 1	A10 19			1.0	wh-gr
W6	F78 a						
W7	F59 a	XM A	SH 1				
XM A	F59 a	SH 1	W 7				
XM B	G 2	SW 1					
XM D	G 3						

02t

Starting the diesel engine, Diesel engine speed adjustment

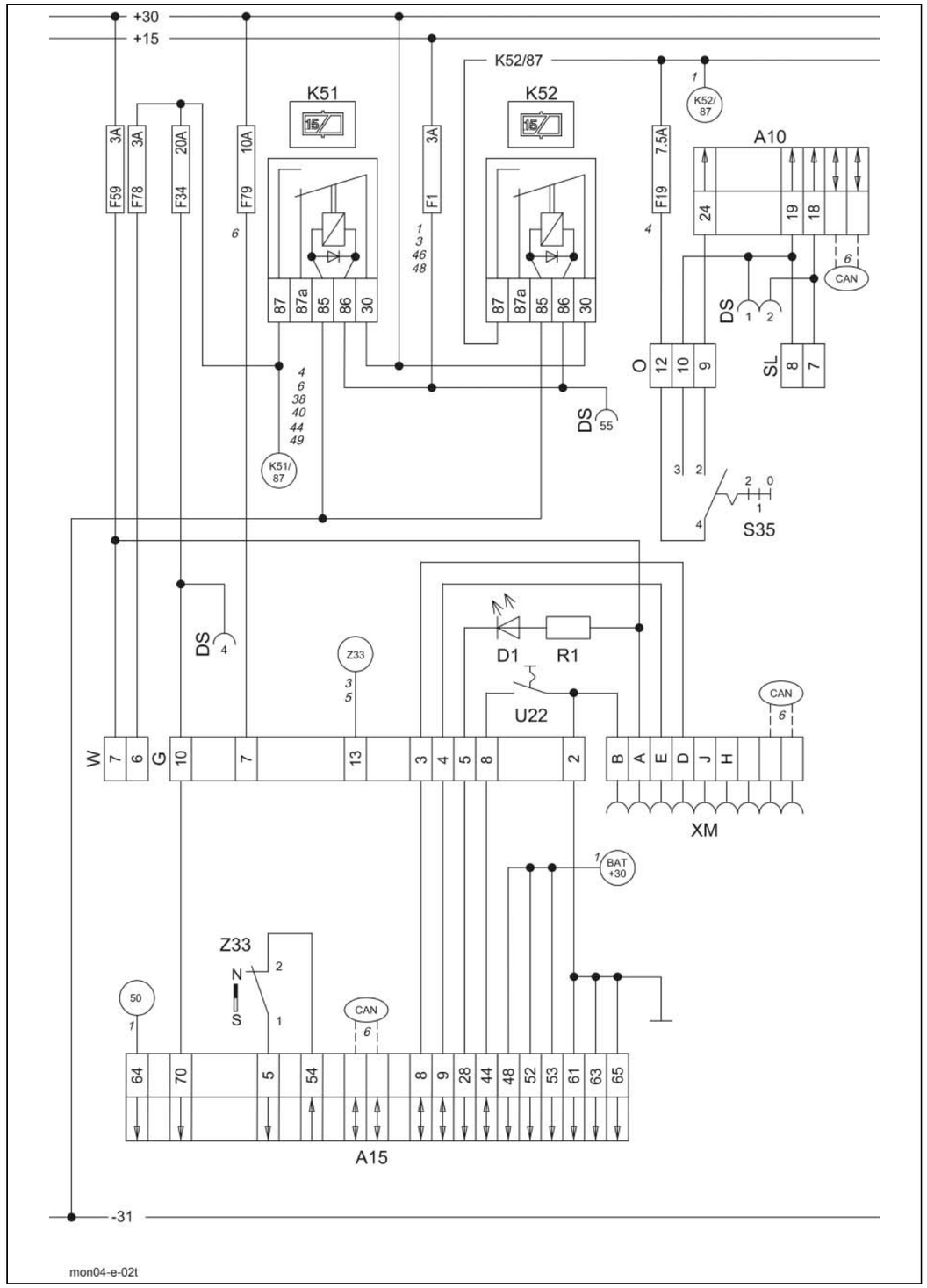
CATERPILLAR -
C12, C10, C9, 3126B

Montana 570-520

- with integrated MONTANA control unit

- from serial no. 581 00027 to 581 00037

02t Starting the diesel engine, diesel engine speed adjustment
- CAT C12, C10, C9, 3126B, Montana 570-520
- with integrated MONTANA control unit (from serial no. 581 00027 to 581 00037)



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A15	Electronic engine control module	3-p-18
D1	Diesel engine error code LED	3-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
R1	Resistor	3-i-20
S35	Engine speed adjustment switch	3-h-17
U22	Diesel engine diagnosis switch	3-i-20
Z33	Coolant level actual value switch	2-o-17
XM	Caterpillar diagnosis connector	4-i-20

Note: The coolant level actual value switch Z33 is **closed** when the coolant level has been properly topped up!

Measured value table:

Item	Component	Measured value	Remark
K51 K52	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

Starting

The engine controller module (A15) is activated via relay K51 by the ignition lock (S64). During the starting procedure, the engine controller module (A15) receives the speed signal from the sensor provided on the camshaft and starts the injection.

Engine monitoring

All sensors relevant for operation and monitoring of the engine are mounted on the engine wiring loom. Only the water level sensor is connected to the CLAAS wiring loom.
The engine controller module (A15) transmits the signals for displaying the engine speed, the coolant level and the coolant temperature to the CAB module (A10) via the CAN bus J1939. The CAB module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.

Engine diagnosis

The number of engine errors occurred and the corresponding error codes can be displayed in the terminal. Further diagnosis is carried out via the diagnosis plug in the central terminal compartment, using the Caterpillar diagnosis tool CAT-ET. The display of error codes can also be activated by the diagnosis LED (D2) after actuating the rocker switch (U22).

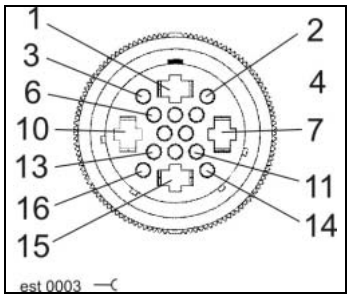
Diesel engine speed adjustment

The diesel engine speed depends on the position of switch S35 and of the 2nd gear actual value switch (Z83) – see also circuit diagram 42t.
When full throttle speed is activated and 2nd gear is engaged, the full throttle speed is reduced to road travel speed specifically for each country. The maximum speed which can be achieved now can be configured using the Claas diagnosis system CDS.

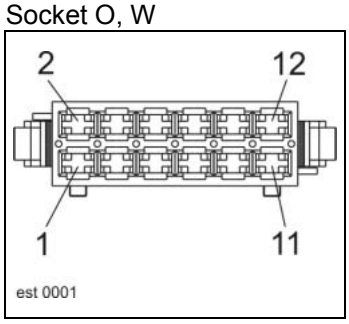
LEXION Type	Idle speed (S35)	Full throttle at no load (S35)	20 km/h (Z83)	25 km/h (Z83)
Montana 570-520	1200 rpm	2100 rpm	1568 rpm	1960 rpm

Connector pin definition:

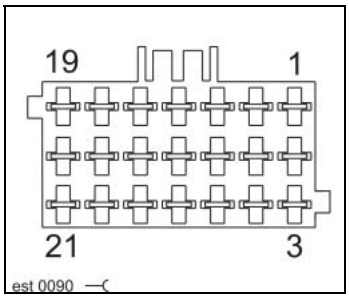
Socket G



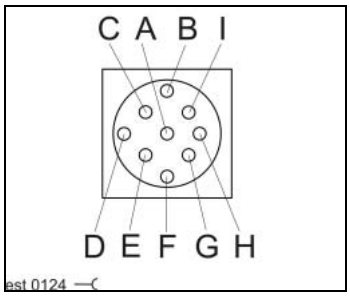
Socket O, W



Socket SL



Socket XM



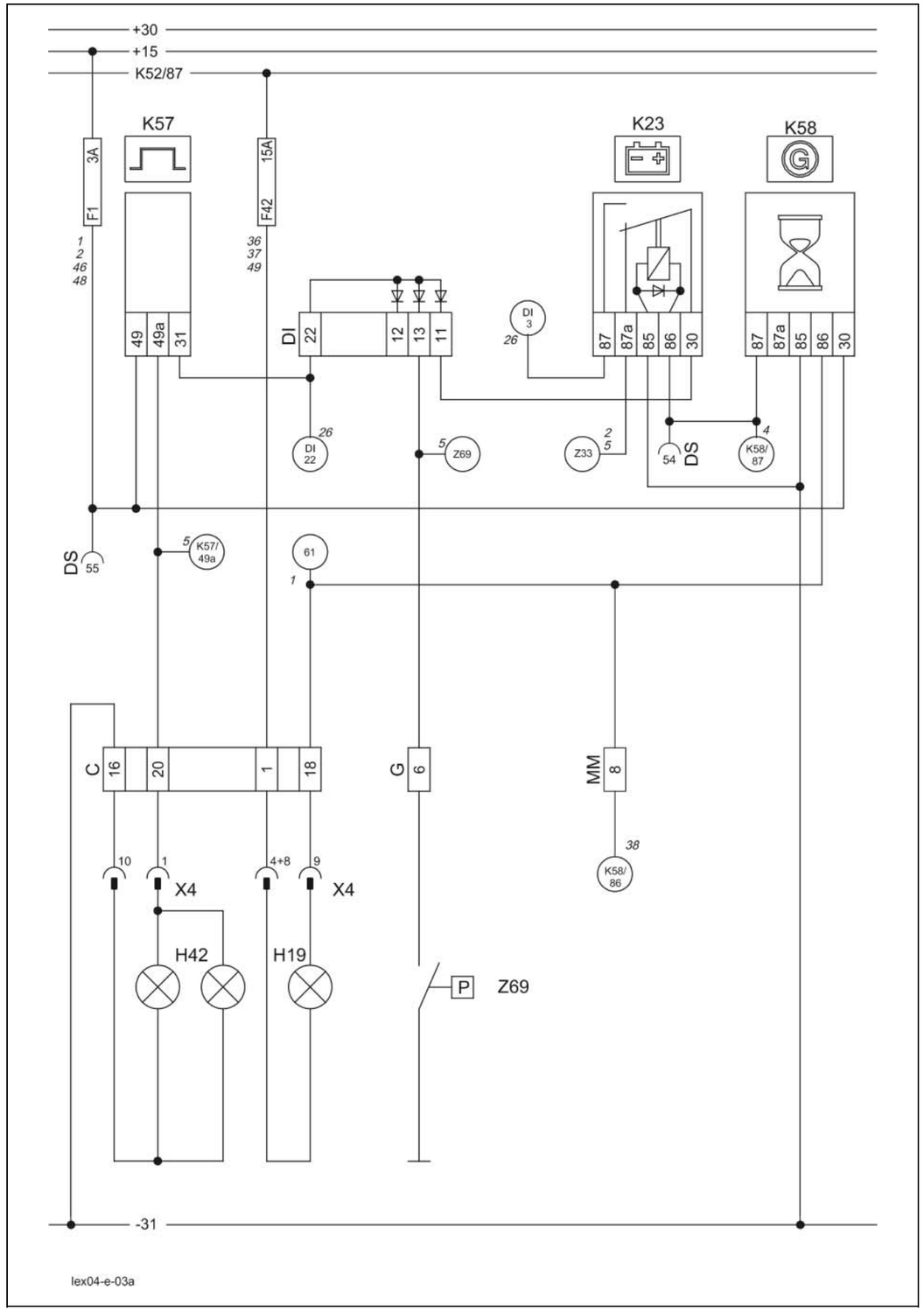
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
G2	SW 1	XM B				1.5	br
G3	XM D					1.0	gn
G4	XM E					1.0	gn-br
G5	SH 2					1.0	wh
G8	SW 2					1.0	ye
G10	F34 a	DS 4	DS 4			1.5	bk
O9	A10 24					1.5	wh-ye
O10	DS 1		A10 19	SL 8		1.5	wh-rd
O12	F19 a					2.5	bk
SL7						1.0	vi-bk
SL8	O 10	DS 1	A10 19			1.0	wh-gr
W6	F78 a						
W7	F59 a	XM A	SH 1				
XM A	F59 a	SH 1	W 7				
XM B	G 2	SW 1					
XM D	G 3						

3a

Diesel engine cut-off system

03a Diesel engine cut-off system



Key to diagram: Coordinates

DI	Warning device diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
H19	Alternator charging light	3-g-18
H42	STOP warning light	3-g-18
K23	Alternator relay	4-i-20
K52	Power supply relay	4-i-20
K57	Transducer relay	4-i-20
K58	Alternator time relay	4-i-20
Z33	Coolant level actual value switch	2-o-17
Z69	Air filter maintenance actual value switch	2-q-18
X4	Steering column indicator lights connector	3-g-18

Measured value table:

Item	Component	Measured value	Remark
K23	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K57	Transducer relay		
K58	Time relay pickup-delayed		

Description of function:

Time relay K58	The electronic circuit in time relay K58 delays the release circuit to the individual consumers by approx. 1.5 sec. and therefore guarantees stable operating voltage for the starting procedure.
Charging voltage warning	Insufficient or absent charging voltage is indicated by alternator charging light (H19). At the same time, the analogue voltage signal of the alternator (G2) is monitored by the fieldwork computer module (A10) and displayed as an alarm in terminal (A30) if necessary. Total failure of the alternator (G2) is reported as a defective V-belt of the cooling water pump in terminal (A30) (see also diagram 1).
Coolant level warning	The explanations regarding the coolant level warning can be found in diagram 2a of the CAT diesel engine and diagram 2b of the DC diesel engine.
Air filter maintenance warning	The earth signal of the vacuum switch (Z69) is switched to terminal (A30) and in parallel via the diode PCB (DI) to the transducer K57.
Temperature warning	For a coolant excess temperature warning, the engine controller module (A15) transmits the corresponding signal to the CAB module (A10) via the CAN bus J1939. The CAB module (A10) converts this signal to the CLAAS CAN bus, allowing display on the terminal. At the same time and as a protective function, the diesel engine reduces its maximum power.
Temperature display	For coolant temperature display, the engine controller module (A15) transmits the corresponding signal to the CAB module (A10) via the CAN bus J1939. The CAB module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.
Error code	Active error codes according to ISO J1939 are displayed in terminal A30 in menu item "Engine loading".

Error code list J 1939: 1/3

SPN	FMI	Description
94		**Engine fuel pressure**
	0	Fuel pressure above set range
	1	Fuel pressure below set range
	3	Fuel pressure sensor; open circuit or short-circuit with battery +
	4	Fuel pressure sensor; short-circuit with earth
	13	Fuel pressure sensor; calibration error
	15	High fuel pressure; warning
	17	Low fuel pressure; warning
100		**Engine oil pressure**
	1	Oil pressure too low (engine power restricted)
	3	Oil pressure sensor; open circuit or short-circuit with battery +
	4	Oil pressure sensor; short-circuit with earth
	13	Oil pressure sensor; calibration error
	17	Low oil pressure; warning
	18	Low oil pressure (engine power restricted)
102		**Engine charge pressure**
	3	Charge pressure sensor; open circuit or short-circuit with battery +
	4	Charge pressure sensor; short-circuit with earth
	13	Charge pressure sensor; calibration error
	15	High charge pressure; warning
	16	High charge pressure (engine power restricted)
108		**Atmospheric pressure sensor**
	3	Atmospheric pressure sensor; open circuit or short-circuit with battery +
	4	Atmospheric pressure sensor; short-circuit with earth
	13	Atmospheric pressure sensor; calibration error
110		**Coolant temperature**
	0	High coolant temperature (engine power restricted)
	3	Coolant temperature sensor; open circuit or short-circuit with battery +
	4	Coolant temperature sensor; short-circuit with earth
	15	High coolant temperature; warning
	16	High coolant temperature (engine power restricted)
111		**Coolant level**
	1	Engine coolant; level too low
	17	Engine coolant; level warning
152		**ADEMIII ECM**
	12	ECM error

Error code list J 1939: 2/3

164 Injection drive pressure sensor
- 0 Injection pressure outside of set range
- 3 Injection pressure sensor; open circuit or short-circuit with battery +
- 4 Injection pressure sensor; short-circuit with earth
- 11 Injection pressure system error

168 Engine control and battery voltage
- 0 Battery voltage too high, overvoltage
- 1 Battery voltage too low, undervoltage
- 2 Battery voltage interrupted

172 Engine intake air temperature
- 0 High intake air temperature (engine power restricted)
- 3 Intake air temperature sensor; open circuit or short-circuit with battery +
- 4 Intake air temperature sensor; short-circuit with earth
- 15 High intake air temperature; warning
- 16 High intake air temperature (engine power restricted)

174 Engine fuel temperature
- 0 High fuel temperature; warning
- 3 Fuel temperature sensor; open circuit or short-circuit with battery +
- 4 Fuel temperature sensor; short-circuit with earth
- 15 High fuel temperature; warning

175 Engine oil temperature
- 3 Centre oil temperature sensor; open circuit or short-circuit with battery +
- 4 Centre oil temperature sensor; short-circuit with earth

190 Engine speed
- 0 Engine overspeed warning
- 2 Engine speed signal not provided
- 3 Engine speed sensor circuit open or short-circuit with battery +
- 8 Engine speed signal is disturbed
- 11 undefined engine speed sensor error

228 Engine speed calibration
- 13 Engine speed; calibration required

234 Engine software
- 2 Engine software incorrect

Error code list J 1939: 3/3

620 5 V power supply
- 3 ECM 5 Volt sensor power supply; open circuit or short-circuit with battery +
- 4 ECM 5 Volt sensor power supply; short-circuit with earth

639 J1939 communication
- 9 J1939 communication not provided

651 Injection cylinder 1
- 11 1st cylinder injection – mechanical fault

652 Injection cylinder 2
- 11 2nd cylinder injection – mechanical fault

653 Injection cylinder 3
- 11 3rd cylinder injection – mechanical fault

654 Injection cylinder 4
- 11 4th cylinder injection – mechanical fault

655 Injection cylinder 5
- 11 5th cylinder injection – mechanical fault

656 Injection cylinder 6
- 11 6th cylinder injection – mechanical fault

678 8 V sensor power supply
- 3 ECM 8 Volt sensor power supply; open circuit or short-circuit with battery +
- 4 ECM 8 Volt sensor power supply; short-circuit with earth

679 Injection drive valve controller
- 11 Injection drive; valve controller driver faulty

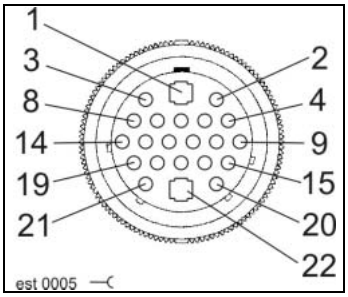
723 Second engine speed sensor
- 2 Second engine speed sensor not provided
- 3 Second engine speed sensor circuit open or short-circuit with battery +
- 8 Second engine speed sensor is disturbed
- 11 undefined engine speed sensor error

729 Heater suction air
- 5 Heater suction air; open circuit
- 6 Heater suction air; short-circuit with earth

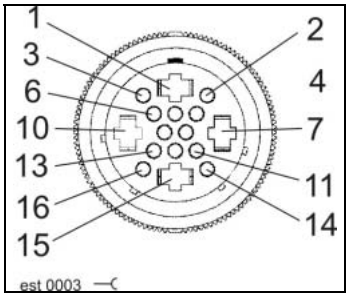
1135 Outside oil temperature sensor
- 3 Outside oil temperature sensor; open circuit or short-circuit with battery +
- 4 Outside oil temperature sensor; short-circuit with earth

Connector pin definition:

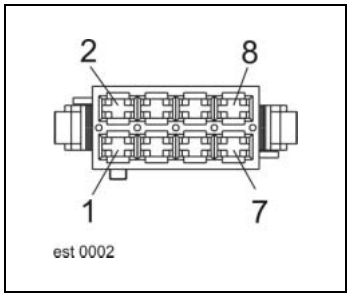
Socket C



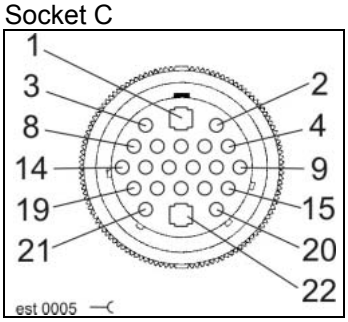
Socket G



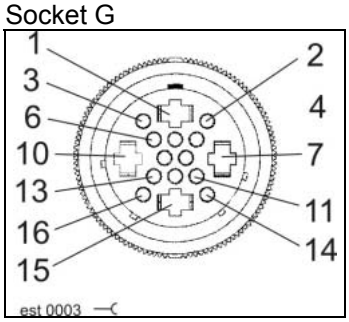
Socket MM



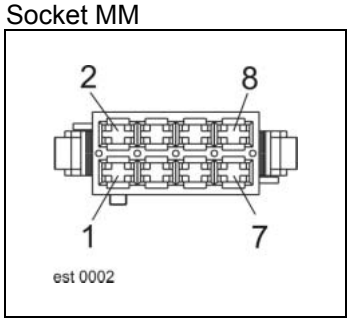
Socket C



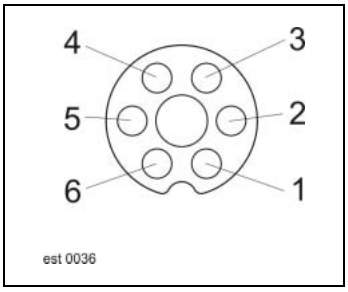
Socket G



Socket MM



Socket X4



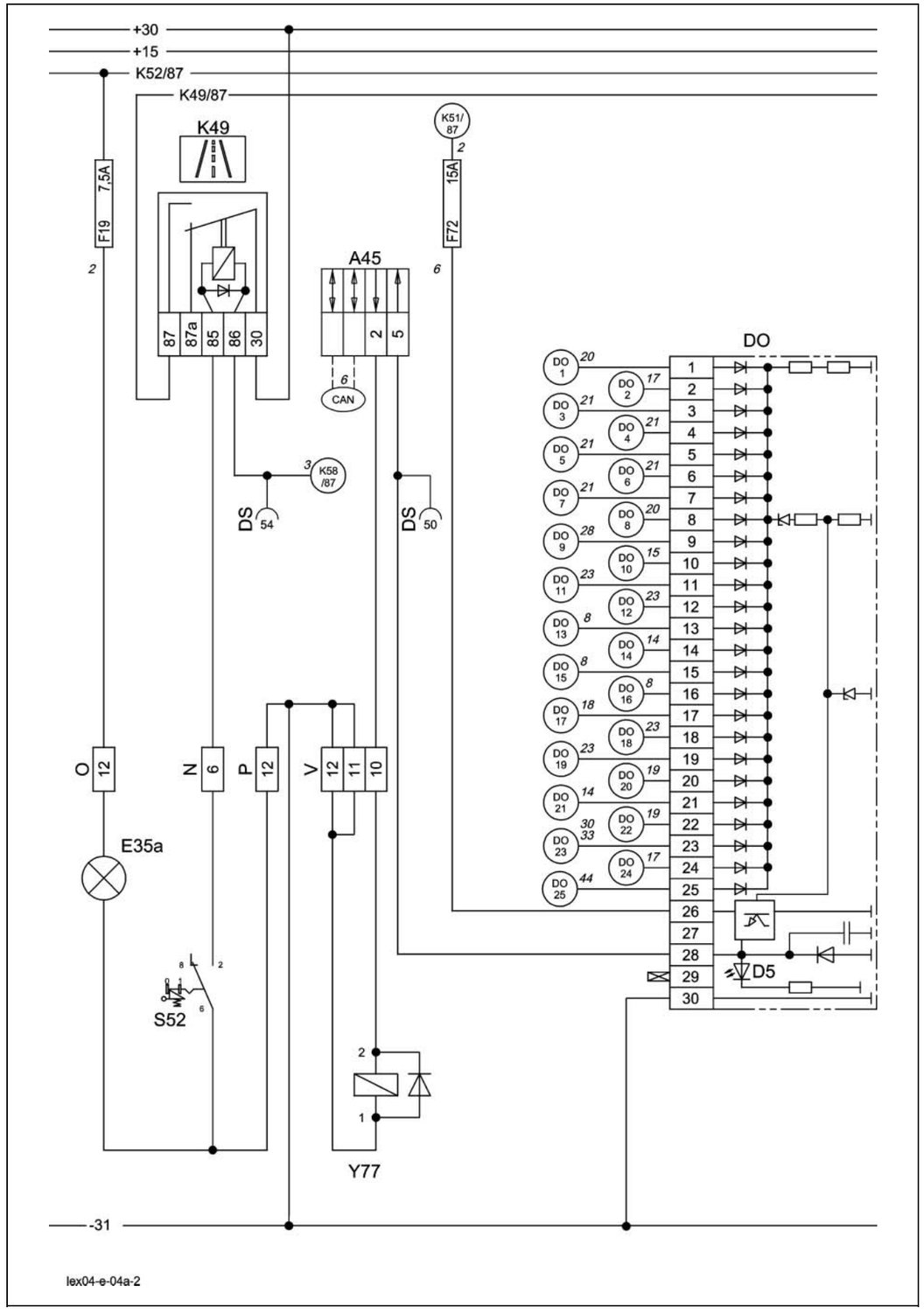
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 1	F42a					1.5	bk
C 16	-31					1.5	br
C 18	G 16	A10 34	K58 86	MM 8		0.35	bl
C 20	A 18	K57 49a				0.35	bk-br
G 6	A 12	DI 13				1.0	bl-ye
MM 8	C 18	G 16	A10 34	K58 86		0.75	bl

4a

Road travel activation, master valve

04a Road travel activation, master valve



Key to diagram:

Coordinates

A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
D5	Master valve DO diode PCB LED	4-i-20
E35a	Instrument lighting	3-h-17
K49	Road travel main relay	4-i-20
K51	Ignition switch relay	4-i-20
K52	Power supply relay	4-i-20
K58	Alternator time relay	4-i-20
S52	Road travel switch (red)	3-h-17
Y77	Working hydraulics master valve solenoid coil	5-n-20

Measured value table:

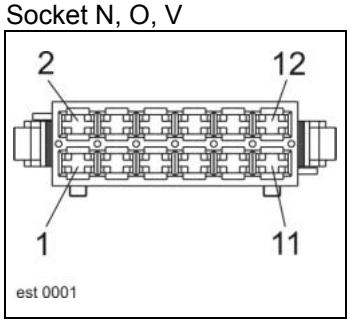
Item	Component	Measured value	Remark
K49	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)
Y77	Solenoid coil	3.8 A 3.2 Ω	see inscription

Description of function:

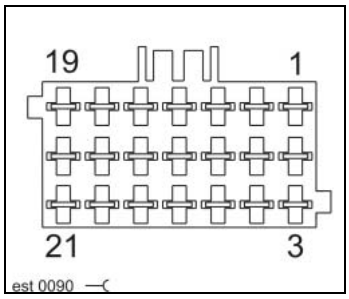
Activation of road travel	During road travel, the safety rocker switch (S52) must be locked in order to cut the power supply for all unnecessary electrical and hydraulic functions.
Master valve	In order to be able to build up the necessary working pressure for many hydraulic controls, the neutral hydraulic circulation must be blocked (see also the "Hydraulic system" section). In this case, the solenoid coil (Y77) is actuated directly via the diode PCB (DO) and the ground drive hydraulic motor brake restrictor module (A45). A LED (D5) provided on the diode PCB indicates the activation of the circuit.

Connector pin definition:

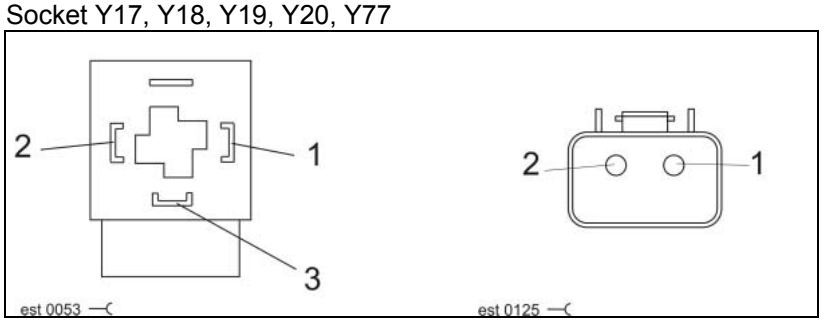
Socket N, O, V



Socket P



Socket Y17, Y18, Y19, Y20, Y77



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
N 6	K49/85					0.5	br-bk
O 12	F19 a					2.5	bk
P 12	-31					2.5	br
V 10	A45/2					1.5	pi-wh
V 11	-31					2.5	br
V 12	-31					2.5	br

04s

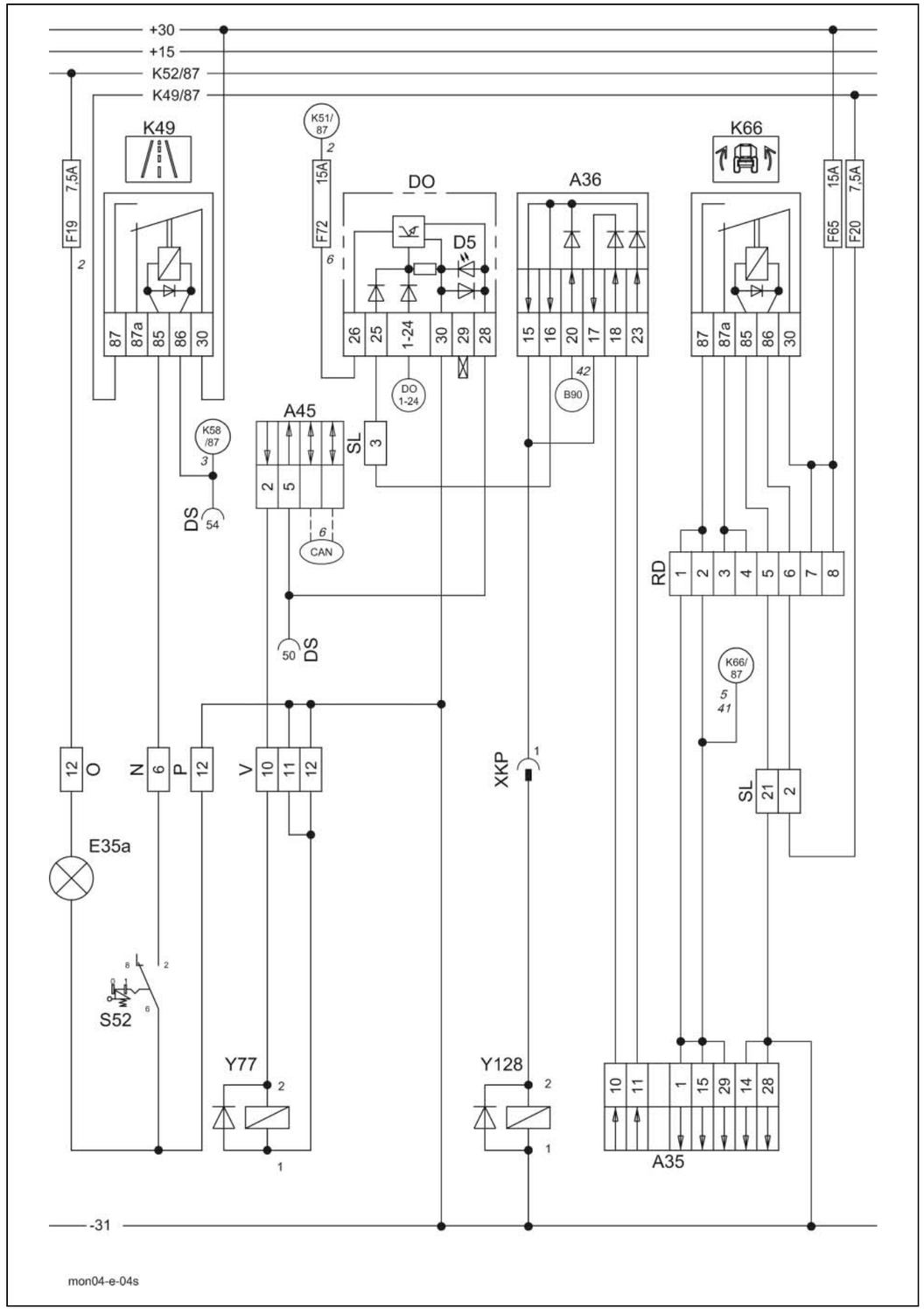
Road travel activation, master valve

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

04s Road travel activation, working hydraulics master valve, Montana 570-520
- with external MONTANA control unit (up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram:

Coordinates

A35	Montana control unit module	7-i-18
A36	Montana gearshift control module	2-h-20
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
B90	Brake accumulator pressure sensor/switch	5-g-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
D5	Master valve DO diode PCB LED	4-i-20
E35a	Instrument lighting	3-h-17
K49	Road travel main relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
K58	Generator time relay	4-i-20
K66	Montana relay	3-h-20
S52	Road travel switch (red)	3-h-17
XKP	Central terminal compartment coupling connector	4-i-20
Y77	Working hydraulics master valve solenoid coil	5-n-20
Y128	Montana master valve solenoid coil	7-i-18

Measured value table:

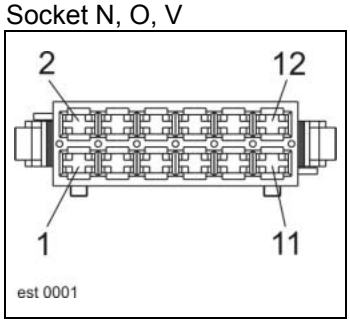
Item	Component	Measured value	Remark
K49	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)
K66	Remote control relay 40 A changeover contact	90±10 Ω	(Pin 86/1 – 85/2
Y77 Y128	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function:

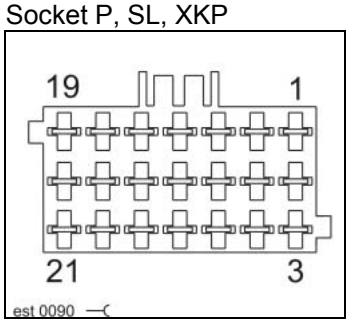
Activation of road travel	During road travel, the road travel switch (S52) must be locked in order to cut the power supply for all unnecessary electrical and hydraulic functions.
Working hydraulics master valve	In order to be able to build up the necessary working pressure for many hydraulic controls, the neutral hydraulic circulation must be blocked (see also the "Hydraulic system" section). The actuation of the working hydraulics master valve (Y77) on Montana machines is **always** via the gearshift control module (A36/pin 16), the diode PCB D0 and the ground drive hydraulic motor brake restrictor module (A45/pin5 → pin2). A LED (D5) provided on the diode PCB indicates the activation of the circuit.
Montana axle hydraulics master valve	For the Montana functions as well, the circulation of the independent axle control system hydraulics must be blocked (see also "Hydraulic System" document). According to the actuated functions, the Montana control unit (A35) actuates the Montana master valve (Y128) and/or the working hydraulics master valve (Y77) via the gearshift control module (A36).
Montana brake pressure accumulator	The sensor/switch (B90) controls the brake system accumulator pressure and, if necessary, actuates the working hydraulics master valve (Y77) via the gearshift control module (A36/pin16), the diode PCB D0 and the Ground drive hydraulic motor brake restrictor module (A45/pin5 → pin2) in order to recharge the brake circuit accumulator – circuit diagram 42s.
Hydrostatic brake valve system	When the diesel engine speed exceeds the allowed maximum of 2230 rpm (e.g. downhill travel), the ground drive hydraulic motor (HBM) brake restrictor module A45 also receives this information from the fieldwork computer module (BIF/CAB) A10 via the CAN bus. Now the ground drive hydraulic motor (HBM) brake restrictor module A45 actuates the master valve (Y77) in order to put a greater load on the drive – circuit diagram 42 of standard machine.

Connector pin definition:

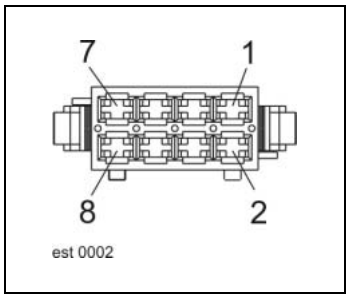
Socket N, O, V



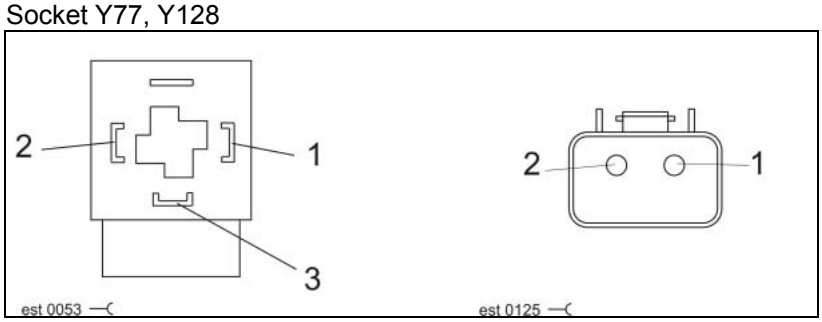
Socket P, SL, XKP



Socket RD



Socket Y77, Y128



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
N 6	K49/85					0.5	br-bk
O 12	F19 a					2.5	bk
P 12	-31					2.5	br
RD 1						1.5	rd-bk
RD 2						1.5	rd-bk
RD 5						0.75	br
RD 6						0.75	bk-vi
V 10	A45/2					1.5	pi-wh
V 11	-31					2.5	br
V 12	-31					2.5	br
SL 2						1.5	bk-vi
SL 3						1.5	vi-rd
SL 21						2.5	br

04t

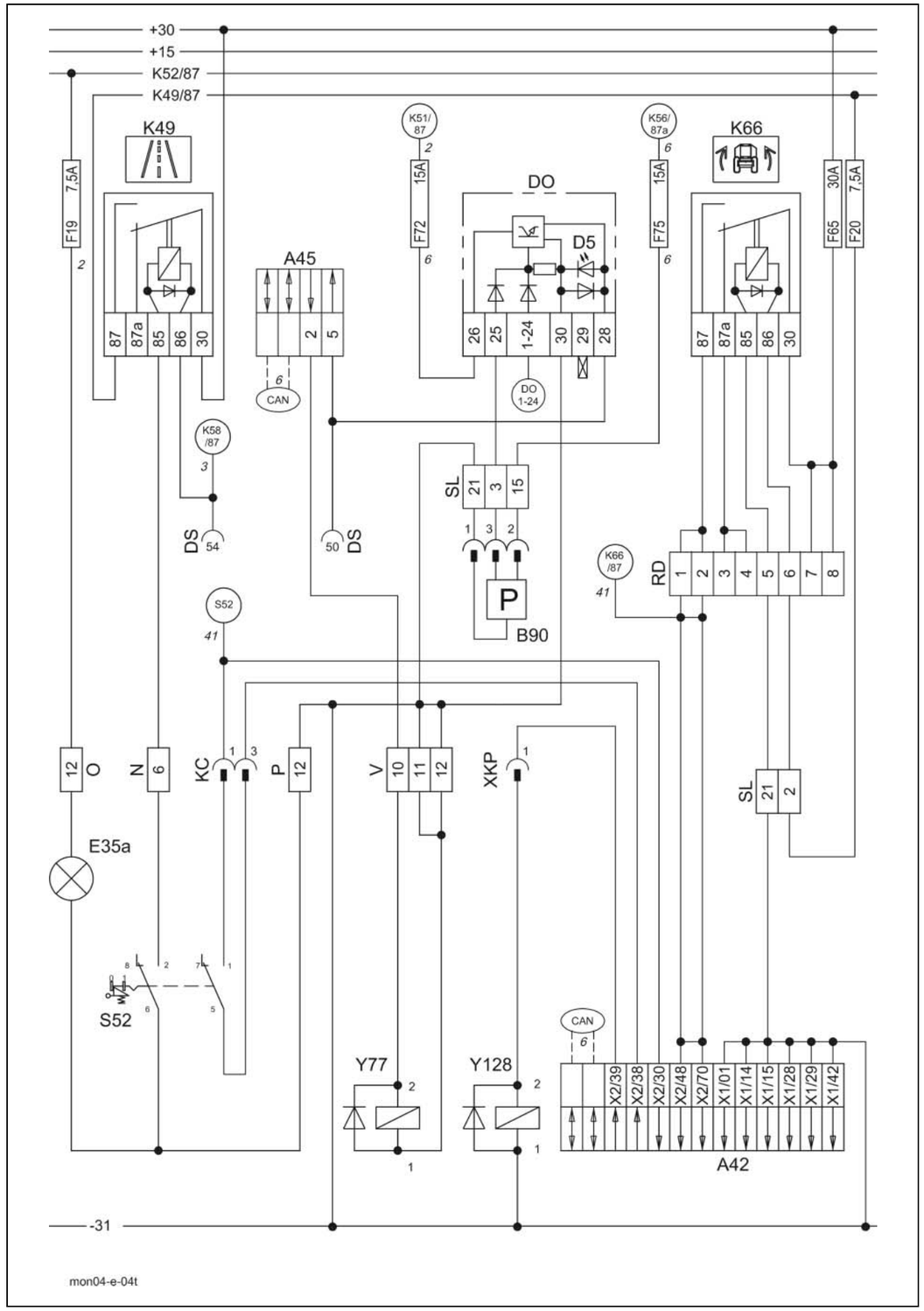
Road travel activation, master valve

Montana 570-520

- with integrated MONTANA control unit

- from serial no. 581 00027 to 581 00037

04t Road travel activation, working hydraulics master valve, Montana 570-520
- with integrated MONTANA control unit (from serial no. 581 00027 to 581 00037)



Key to diagram:

		Coordinates
A42	MONTANA GEN II module	3-h-17
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
B90	Brake accumulator pressure sensor/switch	5-g-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
D5	Master valve DO diode PCB LED	4-i-20
E35a	Instrument lighting	3-h-17
K49	Road travel main relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
K58	Generator time relay	4-i-20
K66	Montana relay	3-h-20
S52	Road travel switch (red)	3-h-17
XKP	Central terminal compartment coupling connector	4-i-20
XP	Panel coupling connector	3-h-17
Y77	Working hydraulics master valve solenoid coil	5-n-20
Y128	Montana master valve solenoid coil	7-i-18

Measured value table:

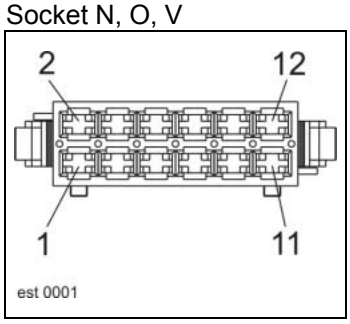
Item	Component	Measured value	Remark
B90	Brake circuit oil pressure / charge pressure	ON OFF	< 135 bar > 165 bar
K49	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)
K66	Remote control relay 40 A changeover contact	90±10 Ω	(Pin 86/1 – 85/2
Y77 Y128	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function:

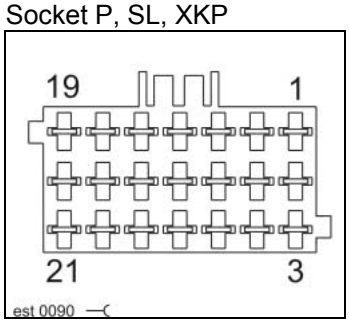
Activation of road travel	During road travel, the road travel switch (S52) must be locked in order to cut the power supply for all unnecessary electrical and hydraulic functions.
Working hydraulics master valve	In order to be able to build up the necessary working pressure for many hydraulic controls, the neutral hydraulic circulation must be blocked (see also the "Hydraulic system" section). On MONTANA machines, actuation of the working hydraulics master valve (Y77) is **always** via the ground drive hydraulic motor brake restrictor module (A45/Pin 5→Pin2). A LED (D5) provided on the diode PCB indicates the activation of the circuit.
Montana axle hydraulics master valve	The MONTANA GEN II module energizes the **working hydraulics master valve (Y77)** with priority, according to the actuated MONTANA functions. Actuation here is via the CAN bus. Only when the control deviation becomes too small within a defined period of time (e.g. machine raises too slowly), the MONTANA master valve (Y128) is additionally energized.
Montana brake pressure accumulator	The sensor (B90) controls the brake system accumulator pressure and, if necessary (p < 135 bar), actuates the working hydraulics master valve (Y77) via the diode PCB D0 and the ground drive hydraulic motor brake restrictor module (A45/pin5→pin2) in order to recharge the brake circuit accumulator – circuit diagram 26t.
Hydrostatic brake valve system	When the diesel engine speed exceeds the allowed maximum of 2230 rpm (e.g. downhill travel), the ground drive hydraulic motor (HBM) brake restrictor module A45 also receives this information from the fieldwork computer module (BIF/CAB) A10 via the CAN bus. Now the ground drive hydraulic motor (HBM) brake restrictor module A45 actuates the master valve (Y77) in order to put a greater load on the drive. When the diesel engine speed exceeds 2300 rpm, the brake restrictor (Y124) is additionally actuated in order to restrict the high-pressure circuit in the ground drive – see circuit diagram 42a of standard machine.

Connector pin definition:

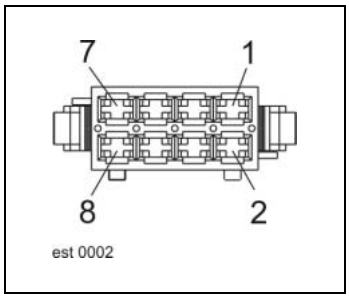
Socket N, O, V



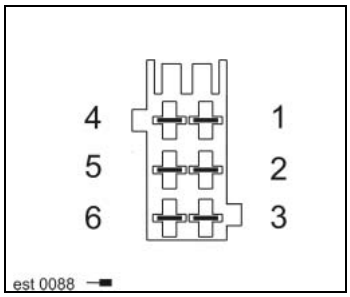
Socket P, SL, XKP



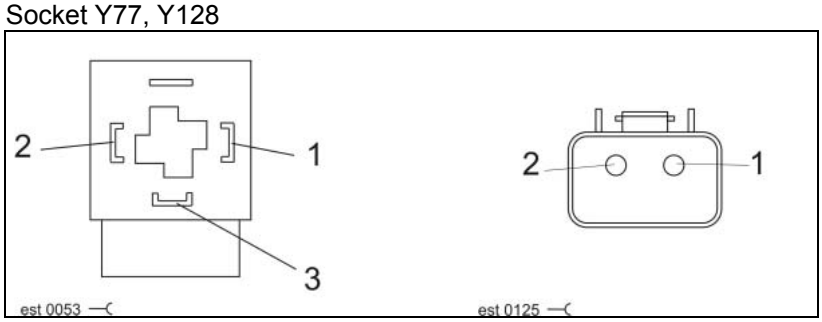
Socket RD



Connector KC



Socket Y77, Y128



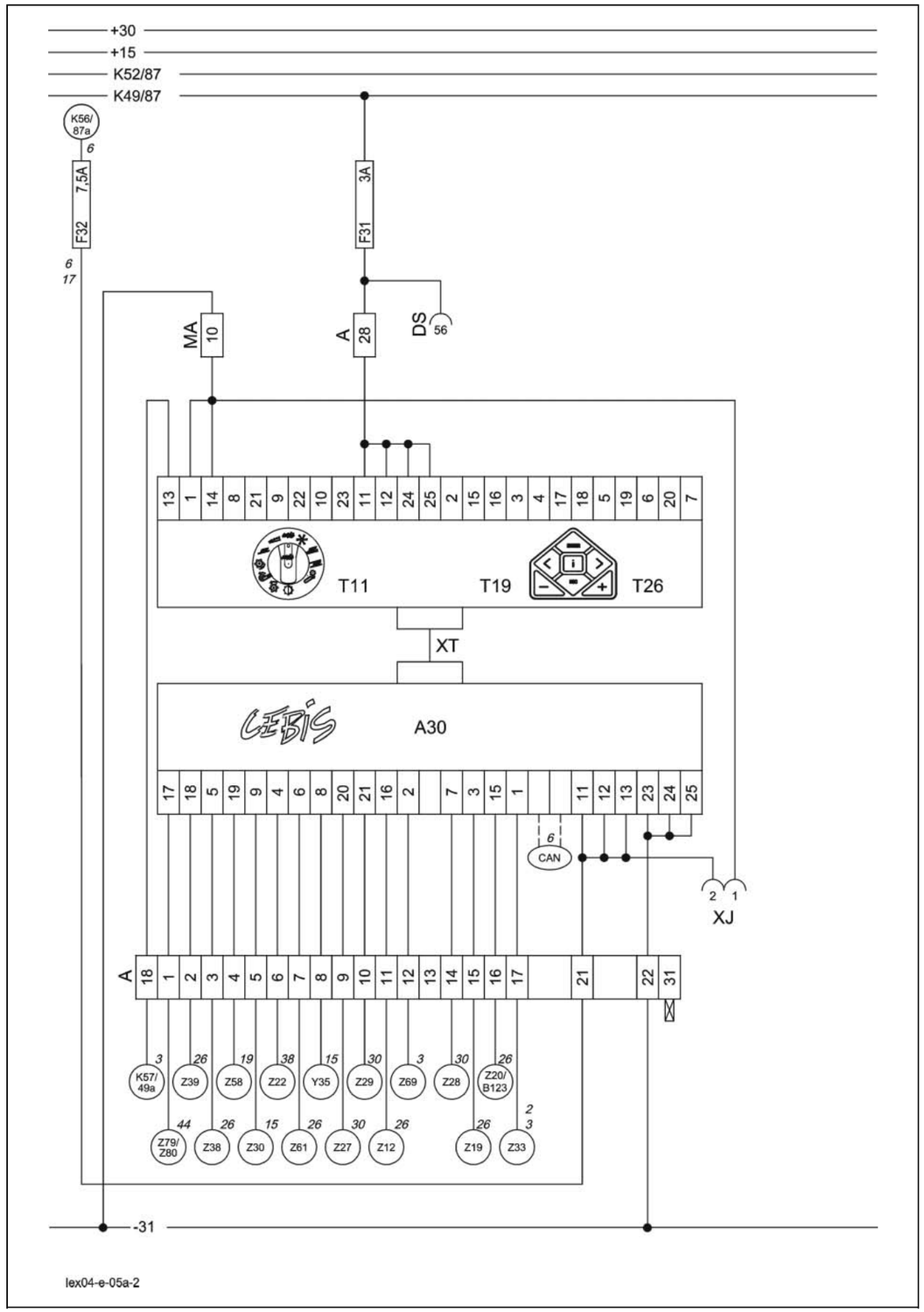
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
KC 1						1.0	bl-bk
KC 3						1.0	wh-bl
N 6	K49/85					0.5	br-bk
O 12	F19 a					2.5	bk
P 12	-31					2.5	br
RD 1						1.5	rd-bk
RD 2						1.5	rd-bk
RD 5						0.75	br
RD6						0.75	bk-vi
V 10	A45/2					1.5	rd-wh
V 11	-31					2.5	br
V 12	-31					2.5	br
SL 2						1.5	bk-vi
SL 3						1.5	vi-rd
SL 21						2.5	br

5a

Terminal, keyboard, rotary switch, printer

05a Terminal, keyboard, rotary switch, printer



Key to diagram:

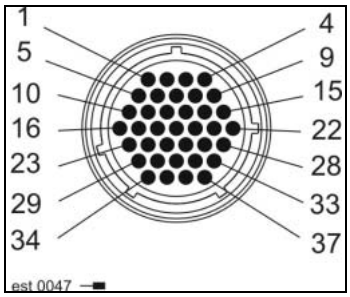
		Coordinates
A30	Terminal	3-g-17
DS	Diagnosis plug (63-pin) VIA	3-i-20
K49	Road travel main relay	4-i-20
K56	Electronic unit plus relay	4-i-20
K57	Transducer	4-i-20
T11	Function pre-selection switch	3-g-17
T19	Minus switch	3-g-17
T26	Plus switch	3-g-17
XJ	Printer connector	3-h-17
Y35	Grain tank unloading solenoid coil	2-p.20
Z12	Parking brake actual value switch	5-g-19
Z19	Hydraulic oil level actual value switch (min.)	2-p-20
Z20	Hydraulic oil temperature actual value switch	2-p-19
Z22	Compressor-type air conditioner high pressure actual value switch	2-n-17
Z27	Grain tank 100% full indicator actual value switch	2-j-18
Z28	Grain tank 70% full indicator actual value switch	2-j-18
Z29	Grain tank extension open actual value switch	2-k-18
Z30	Grain tank unloading tube swung out actual value switch	2-k-20
Z33	Coolant level actual value switch	2-o-17
Z38	Left steering position actual value switch	7-q-20
Z39	Right steering position actual value switch	7-q-16
Z58	Straw chopper/uni-spreader working position actual value switch	5-t-20
Z61	Straw jam warning actual value switch	3-s-18
Z69	Air filter maintenance actual value switch	2-q-18
Z79	Left brake circuit pressure actual value switch	5-h-17
Z80	Right brake circuit pressure actual value switch	5-h-17

Description of function:

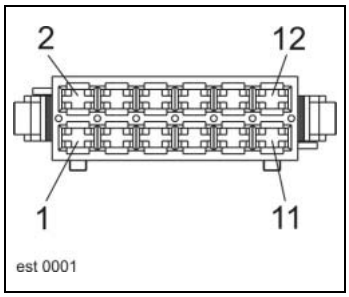
Connectors	Connector A is connected with signal inputs from switches whose actuated or non-actuated states allow the terminal to identify the machine functions. The analogue signals of the machine sensors are converted by the corresponding modules (A10/A12) and read by the terminal as digital signals from the CAN bus system.

Connector pin definition:

Connector A



Socket MA



Interconnection list:

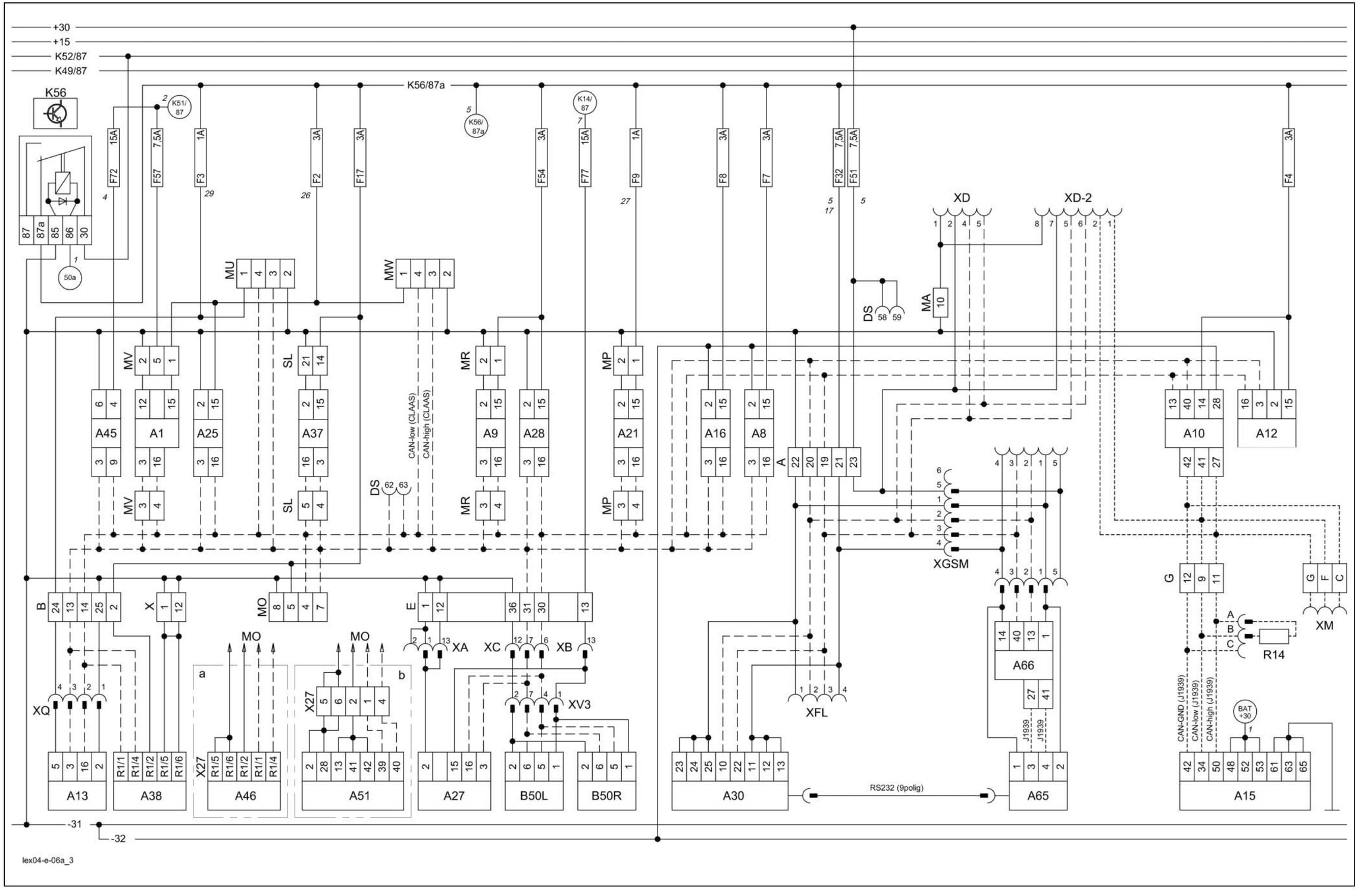
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A1	U 10	SL 20	U 10			0.35	vi-wh
A2	BB 22					0.35	or-rd
A3	BB 21					0.35	or-bk
A4	MN 4	DS 33				0.35	gn-ye
A5	B 20	W 4	DS 16	H 6	A34 4R	0.35	pi
A6	G 14	K24 85				0.35	bl
A7	B 19					0.35	rd
A8	A34 8L	W 3	H 5	DS 15	M 21	0.35	bk
A9	MH 6					0.35	vi
A10	MH 8					0.35	gr-pi
A11	T 8	Y 2	SL 6			0.35	rd-bl
A12	G 6	DI 13				0.35	wh-gn
A14	MH 5	K62 85				0.35	wh-ye
A15	W 9	DI 4				0.35	ye-br
A16	W 5					0.35	wh-gr
A17	K23 87a	G 13				0.35	gr-br
A18	K57 49a	C 20				0.35	gr-bk
A 19	A10 40	A12 3	MP 3	A16 3	A8 3	0.35	pi-br
	MO 7	E 31	MU 3	MV 3	MW 3		
	A28 3	MR 3	SL 4	A25 3	A45 3		
	B 13	B 13					
A20	A10 13	A12 16	MP 4	A16 16	A8 16	0.35	wh-bl
A21	F32 a					1.0	bk
A22	31 Earth					1.0	br
A23	F51 a	DS 58	DS 59			1.0	rd
A 28	F31 a	DS 56				1.0	bk-wh
MA 10	-31					1.5	br

6a

CAN bus, module power supply

for diesel engines
CATERPILLAR - C12, C10, C9, 3126B

06a CAN bus, module power supply, for diesel engine CATERPILLAR - C12, C10, C9, 3126B



Key to diagram: Coordinates

A1	AGROCOM Terminal	2-i-17
A8	AUTOCONTOUR module (CAC)	2-i-20
A9	AUTOPILOT module	2-i-20
A10	Fieldwork computer module (BIF/CAB))	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A13	Performance monitor module (DKG)	4-p-20
A15	Electronic engine control module	3-p-18
A16	Reel controller module (HAS)	2-i-20
A21	YIELD METER module (LEM)	2-i-20
A25	Sieve adjustment module	2-i-20
A27	VARIO module	8-f-20
A28	Uni-spreader module (VGS)	2-i-20
A30	Terminal	3-g-17
A37	LEXION electro-hydraulic gearshift module (EHS)	2-i-20
A38	Rotor RIO module (RIO)	4-n-20
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
A46	Deflector adjustment module (RIO)	5-t-16
A51	Radial spreader module	5-s-18
A65	GPS pilot terminal	3-g-17
A66	GPS pilot module (GPB)	3-g-17
B50 L	AUTOPILOT left laser sensor	6-e-25
B50 R	AUTOPILOT right laser sensor	6-e-11
DS	Diagnosis plug (63-pin) VIA	3-i-20
XM	Caterpillar Diagnosis connector	4-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
K51	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
R14	CAN bus terminal resistor	3-q-18
XFL	External CAN bus connection (e.g. flagging box, Agrocom terminal, etc.)	3-h-17
XGSM	External CAN bus connection Bus (e.g. GSM modem)	3-h-17
XQ	Performance monitor connector	5-p-20
XA	Multifunction coupling A connector	7-f-20
XB	Multifunction coupling B connector	7-f-20
XC	Multifunction coupling C connector	7-f-20
XD	CAN bus terminal connector (7-pin)	3-g-17
XD-2	CAN bus connector (8-pin)	4-i-17
XV3	AUTOPILOT variant plug connector	7-f-20

a - for versions with deflector adjustment
b - for versions with radial spreader

Measured value table:

Item	Component	Measured value	Remark
R14	Resistor	approx. 120 Ω	
K56	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)

Description of function:

CAN bus
(Controller Area Network)

Data exchange between electronic components using a serial network.

- Measured value table CAN bus

CAN high (U_{eff})	CAN low (U_{eff})	Diagnosis
1.9 ± 0.2 Volt	3.2 ± 0.2 Volt	System OK
approx. 2.5 Volt	approx. 2.5 Volt	Short-circuit CAN high / CAN low
approx. 1.9 Volt	> 3.2 Volt	Short-circuit CAN high / +12 Volt
approx. 2.5 Volt	< 3.2 Volt	Short-circuit CAN high / Earth
> 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / +12 Volt
< 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / Earth

BIF/CAB module (A10)

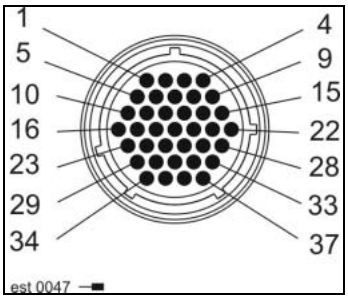
The abbreviation BIF stands for fieldwork computer and the abbreviation CAB for CAN bridge.
This module saves the essential machine data
(machine number, operating hours ...) = BIF.
At the same time, this module constitutes the interface between different CAN bus systems (CLAAS - Caterpillar - Daimler/Chrysler) = CAB.

Data storage

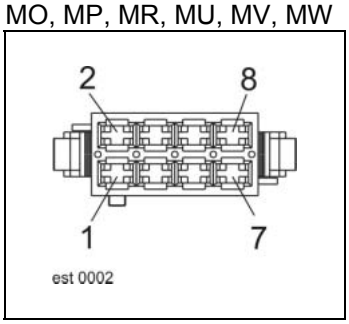
All yield data is saved in the yield meter module (A21) whereas all other performance data is saved in the fieldwork computer / CAN bridge module (A10). It is therefore recommended to transmit these data prior to replacing a defective module, using the CLAAS diagnosis system CDS.

Connector pin definition:

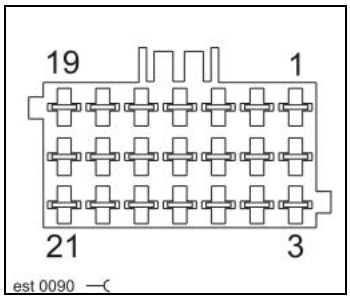
Connector B, E



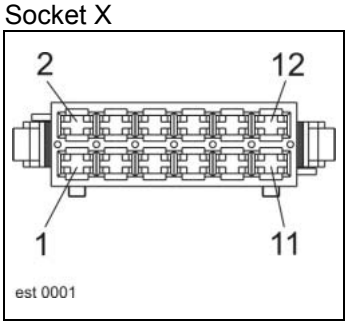
Socket
MO, MP, MR, MU, MV, MW



Socket SL



Socket X



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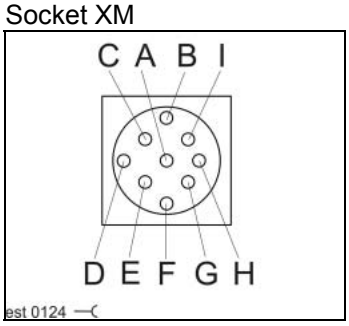
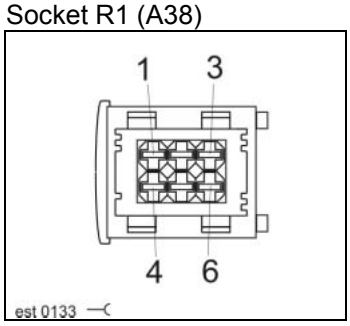
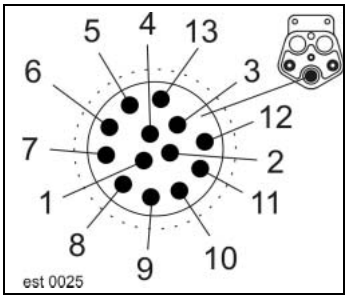


Socket R1 (A38)



Connector XA



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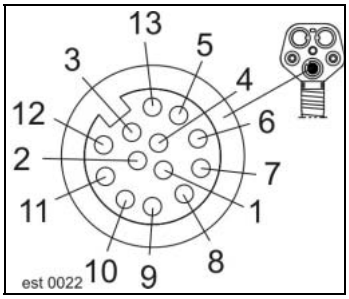
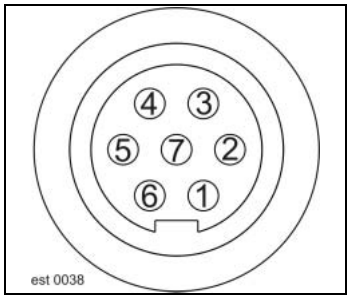
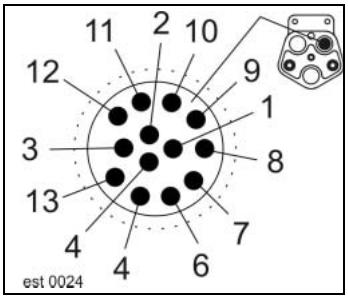


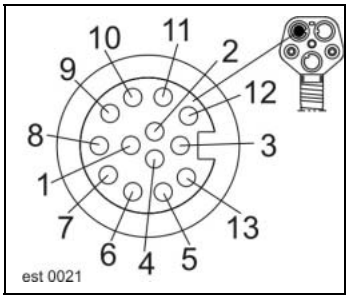
Socket XD



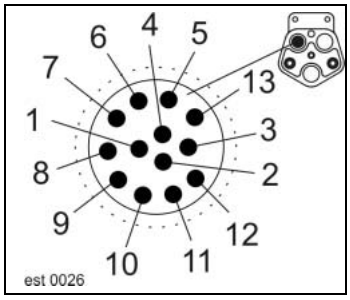
Connector XB



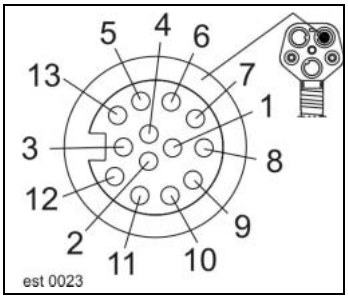
Socket XB



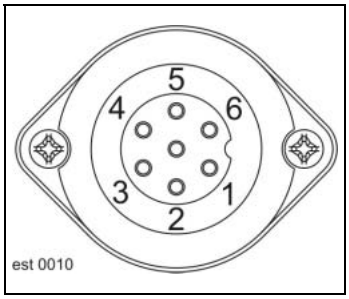
Connector XC



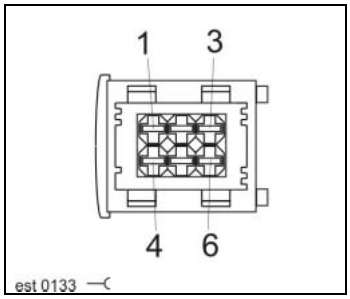
Socket XC



Socket XV3



Socket X27



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B2	F17 a	MO 5	SL 14			1.5	bk-bl
B13	A10 40	A12 3	MP 3	A16 3	A8 3	1.0	or
	MO 7	E 31	MU 3	MV 3	MW 3		
	A28 3	MR 3	SL 4	A25 3	A45 3		
	DS 62	A 19					
B14	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A 20	A10 13	A12 16	MP 4	A16 16		
	MO 4	E 30	MU 4	MV 4			
B24	B 24	F03 a	MU 1			1.5	bk
B25	31 Earth					1.5	br-bl
E1	31 Earth					1.5	br
E12	31 Earth					1.5	br
E13	F77 a					1.5	bk-bl
E30	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
E31	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A 19	A10 40	A12 3	MP 3	A16 3		
E36	31 Earth					1.5	br
MO4	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MO5	F17 a	B 2	SL 14			1.0	bk-bl
MO7	A 19	A10 40	A12 3	MP 3	A16 3	1.0	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MO8	31 Earth						

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MP 1	F09 a						
MP2	31 Earth						
MP3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MP4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MR1	A28 15	F54 a					
MR2	31 Earth						
MR3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MR4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
MU1	B 24	F03 a					
MU2	31 Earth						
MU3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MU4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				

Interconnection list:

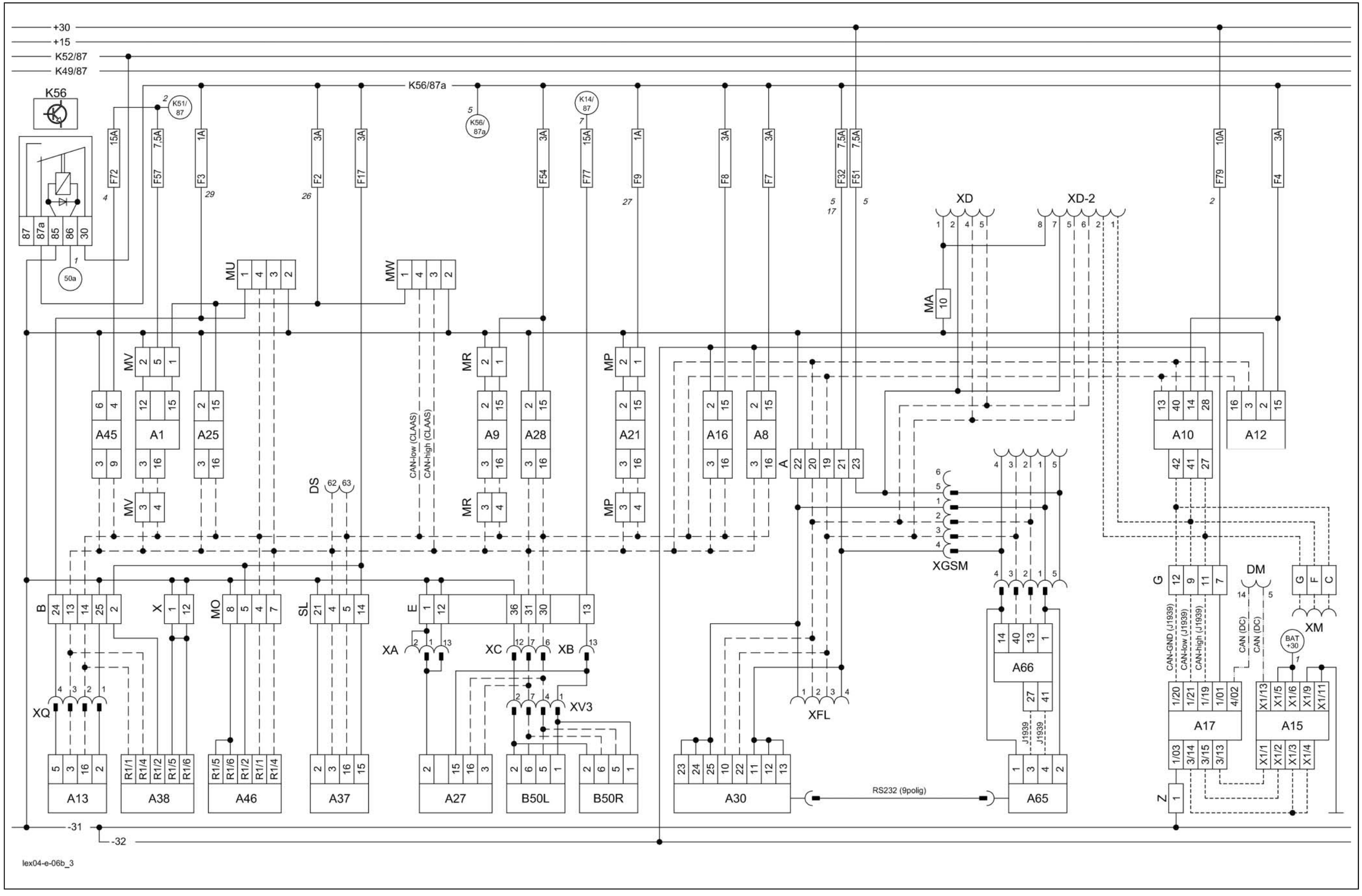
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MV2	31 Earth						
MV3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MV4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV5	F57 a						
MW 1	F02 a	MV 1	A25 15				
MW2	31 Earth						
MW3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	A45 3					
MW4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	A45 9					
SL4	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	A45 3	A25 3		
	MW 3	A8 3					
SL5	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	MW 4	A25 16		
	A8 16	A45 9					
SL14	F17 a	MO 5	B 2			0.75	bk-bl
SL21	31 Earth					2.5	br
X1	31 Earth					2.5	br
X12	31 Earth					2.5	br
X27 - 1						0.75	ye
X27 - 2						1.0	bk/bl
X27 - 3						1.5	bk/vi
X27 - 4						0.75	or
X27 - 5						1.0	br
X27 - 6						1.5	br

6b

CAN bus, module power supply

for diesel engine
Daimler - Chrysler DC 502 LA

06b CAN bus, module power supply, for diesel engine Daimler - Chrysler DC 502 LA



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XA	Multifunction coupling A connector	7-f-20
XB	Multifunction coupling B connector	7-f-20
XC	Multifunction coupling C connector	7-f-20
XD	CAN bus terminal connector (7-pin)	3-g-17
XD-2	CAN bus connector (8-pin)	4-i-17
XV3	AUTOPILOT variant plug connector	7-f-20

Measured value table:

Item	Component	Measured value	Remark
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BIF/CAB module (A10)

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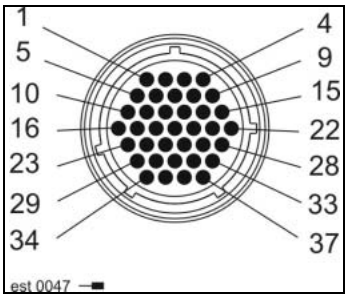
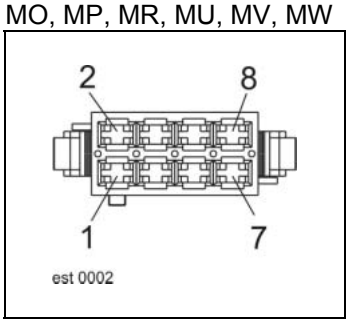
Connector pin definition:

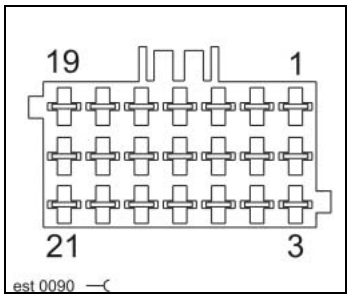
Connector B, E



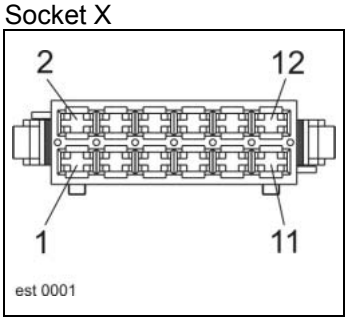
Socket
MO, MP, MR, MU, MV, MW



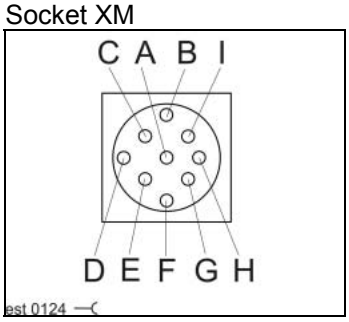
Socket SL



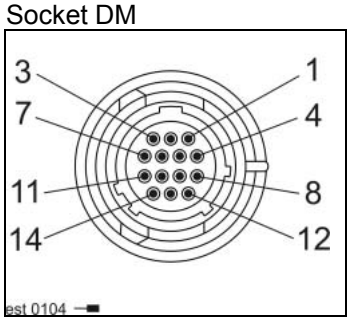
Socket X



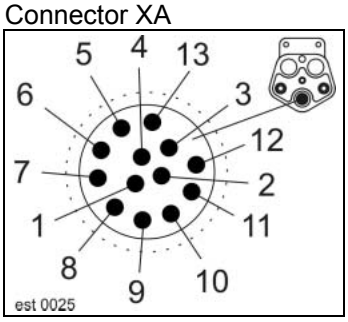
Socket XM



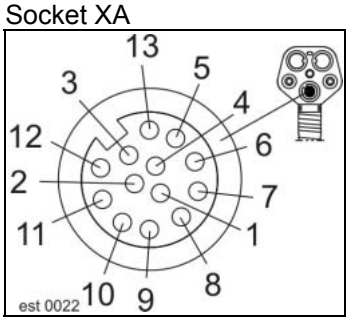
Socket DM



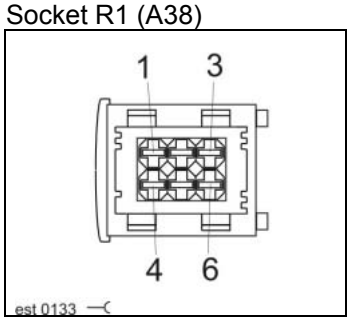
Connector XA



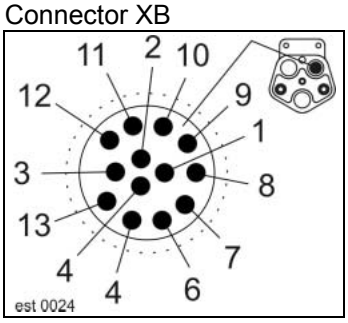
Socket XA



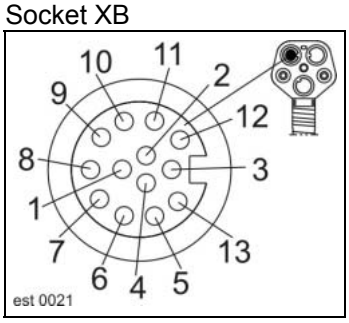
Socket R1 (A38)



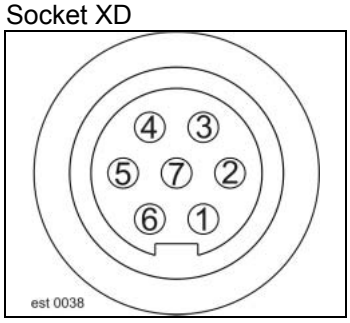
Connector XB



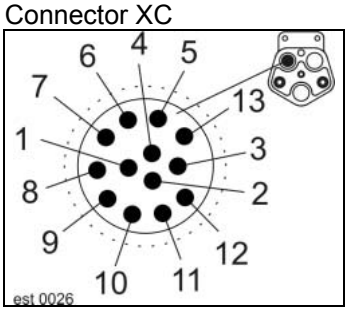
Socket XB



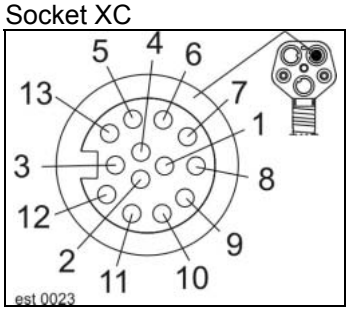
Socket XD



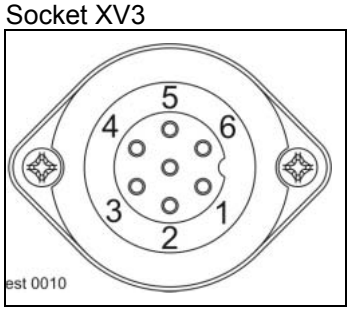
Connector XC



Socket XC



Socket XV3



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B2	F17 a	MO 5	SL 14			1.5	bk-bl
B 13	A10 40	A12 3	MP 3	A16 3	A8 3	1.0	or
	MO 7	E 31	MU 3	MV 3	MW 3		
	A28 3	MR 3	SL 4	A25 3	A45 3		
	DS 62	A 19					
B 14	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A 20	A10 13	A12 16	MP 4	A16 16		
	MO 4	E 30	MU 4	MV 4			
B24	B 24	F03 a	MU 1			1.5	bk
B25	31 Earth					1.5	br-bl
E1	31 Earth					1.5	br
E12	31 Earth					1.5	br
E13	F77 a					1.5	bk-bl
E30	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
E31	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A 19	A10 40	A12 3	MP 3	A16 3		
E36	31 Earth					1.5	br
MO4	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MO5	F17 a	B 2	SL 14			1.0	bk-bl
MO7	A 19	A10 40	A12 3	MP 3	A16 3	1.0	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MO8	31 Earth						

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MP 1	F09 a						
MP2	31 Earth						
MP3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MP4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MR1	A28 15	F54 a					
MR2	31 Earth						
MR3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MR4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
MU1	B 24	F03 a					
MU2	31 Earth						
MU3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MU4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MV2	31 Earth						
MV3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MV4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV5	F57 a						
MW 1	F02 a	MV 1	A25 15				
MW2	31 Earth						
MW3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	A45 3					
MW4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	A45 9					
SL4	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	A45 3	A25 3		
	MW 3	A8 3					
SL5	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	MW 4	A25 16		
	A8 16	A45 9					
SL14	F17 a	MO 5	B 2			0.75	bk-bl
SL21	31 Earth					2.5	br
X1	31 Earth					2.5	br
X12	31 Earth					2.5	br

06s

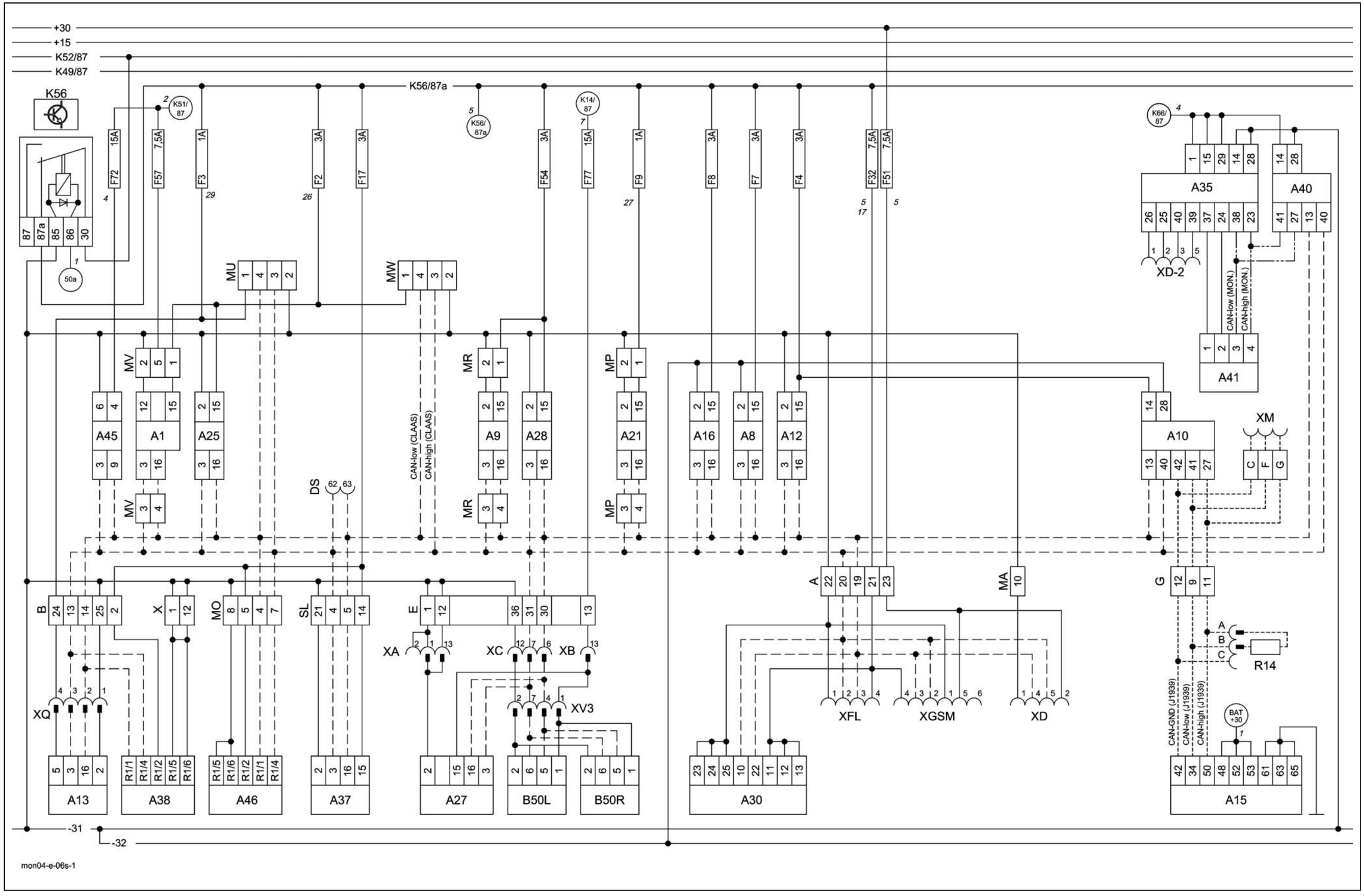
CAN bus, module power supply

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

06s CAN bus, module power supply, Montana 570-520 - with external MONTANA control unit
(up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram: Coordinates

A1	AGROCOM terminal	2-i-17
A8	AUTOCONTOUR module (CAC)	2-i-20
A9	AUTOPILOT module	2-i-20
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A13	Performance monitor module (DKG)	4-p-20
A15	Electronic engine control module	3-p-18
A16	Reel controller module (HAS)	2-i-20
A21	YIELD METER module (LEM)	2-i-20
A25	Sieve adjustment module	2-i-20
A27	VARIO module	8-f-20
A28	Uni-spreader module (VGS)	2-i-20
A30	Terminal	3-g-17
A35	Montana control unit module	7-i-18
A38	Rotor RIO module (RIO)	4-n-20
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
A40	Axle control system adaptation module	2-h-17
A41	Montana terminal	3-f-17
A46	Deflector adjustment module (RIO)	5-t-16
A51	Radial spreader module	5-s-18
B50 L	AUTOPILOT laser sensor, left	6-e-25
B50 R	AUTOPILOT laser sensor, right	6-e-11
DS	Diagnosis plug (63-pin) VIA	3-i-20
XM	Caterpillar diagnosis connector	4-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
K51	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
R14	CAN bus matching resistor	3-q-18
XFL	External CAN bus connection (e.g. flagging box, Agrocom terminal, etc.)	3-h-17
XGSM	External CAN bus connection (e.g. GSM modem)	3-h-17
XQ	Performance monitor connector	5-p-20
XA	Multifunction coupling A connector	7-f-20
XB	Multifunction coupling B connector	7-f-20
XC	Multifunction coupling C connector	7-f-20
XD	CAN bus terminal connector (7-pin)	3-g-17
XD-2	CAN bus connector (8-pin)	4-i-17
XV3	AUTOPILOT variant plug connector	7-f-20

Measured value table:

Item	Component	Measured value	Remark
R14	Resistor	approx. 120 Ω	
K56	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)

Description of function: 1/2

CAN bus
(Controller Area Network)

Data exchange between electronic components via a serial network.

- Measured value table CAN bus

CAN high (U_{eff})	CAN low (U_{eff})	Diagnosis
1.9 ± 0.2 Volt	3.2 ± 0.2 Volt	System OK
approx. 2.5 Volt	approx. 2.5 Volt	Short-circuit CAN high / CAN low
approx. 1.9 Volt	> 3.2 Volt	Short-circuit CAN high / +12 Volt
approx. 2.5 Volt	< 3.2 Volt	Short-circuit CAN high / Earth
> 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / +12 Volt
< 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / Earth

BIF/CAB module (A10)

The abbreviation BIF stands for the German "Bordinformator" (Fieldwork computer), the abbreviation CAB for CAN bridge.
The essential machine data (serial no., operating hours, etc.) are stored in this module = BIF.
At the same time, this module constitutes the interface between different CAN bus systems (CLAAS - Caterpillar - Daimler/Chrysler) = CAB.

Data storage

All yield data is saved in the yield meter module (A21) whereas all other performance data is saved in the fieldwork computer / CAN bridge module (A10). It is therefore recommended to transmit these data prior to replacing a defective module, using the diagnosis system CDS.

MONTANA control unit
(axle and front attachment control system)

The MONTANA control system includes the axle control system and a front attachment control system complementing the CLAAS AUTO-CONTOUR system (CAC).

The axle control system varies the height of the final drives of the rear axle. For tilting the machine to one side, first the uphill side is lowered and then the downhill side is raised.
The MONTANA front attachment control system allows varying the swing angle (cross levelling) and the cutting angle by adjusting the front attachment frame, in addition to the CAC functions.

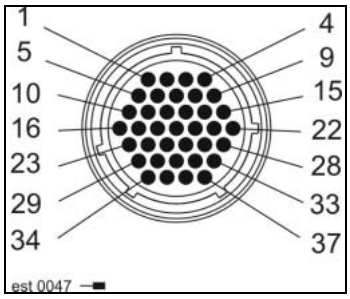
The electronic control of the MONTANA functions is via a separate CAN bus. The CAN data are converted in the axle control system adaptation module (A40) and made available to the CLAAS CAN bus system. According to the axle position, the value of the feed rake conveyor position sensor (B35) is offset in the AUTOCONTOUR module (CAC). This allows working in hilly ground with the CAC function "Pre-set cutting height control" and area counting.

Description of function: 2/2

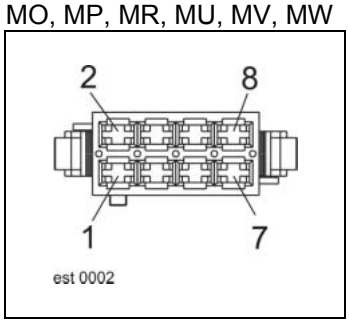
AUTOCONTOUR (CAC) Settings for Montana machines	The adaptation of the AUTOCONTOUR (CAC) and the axle control systems requires special settings for Montana machines.
- Cutterbar spring setting	The 5 mm cutterbar spring setting (see also Operator's Manual) must be made at a 50 % axle position.
- Check of cutterbar spring setting	Check setting dimension when travelling downhill with the axle cylinders fully extended. This dimension may be only < 15 mm.
- Learning the CAC limit stops	The limit stops of the CAC sensors must be learned at a 75 % axle position. While doing this, the cutting angle must be adjusted to the working position (cutterbar table surface in parallel with the ground).
- CAC sensitivity	The recommended CAC sensitivity for use with the grain cutterbar is 45 % with Montana machines.
- Drop rate setting (front attachment)	The drop rate must be adjusted with the machine at operating temperature and 50 % axle position. The drop rate is 5 – 6 seconds from the top to the bottom position.
- Set value adjustment of CAC cutting height control	When working in the field, the cutting height control set value (working within the sensor band range) should not be set higher than position 8.

Connector pin definition:

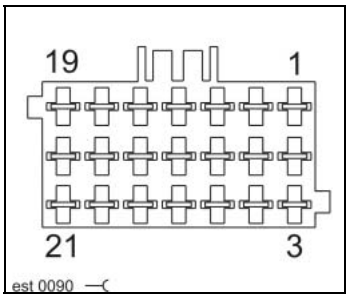
Connector B, E



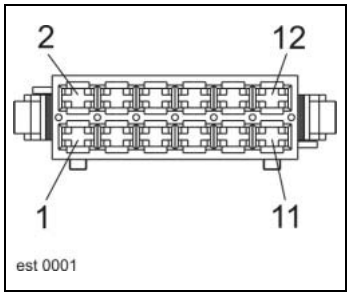
Socket
MO, MP, MR, MU, MV, MW



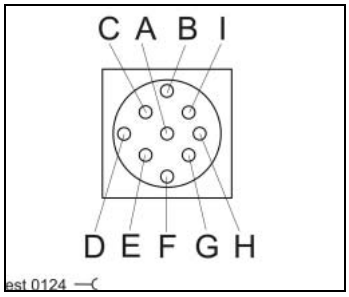
Socket SL



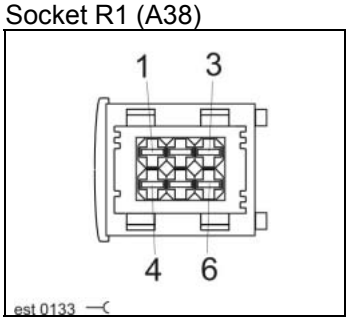
Socket X



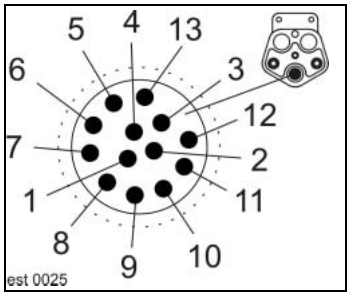
Socket XM



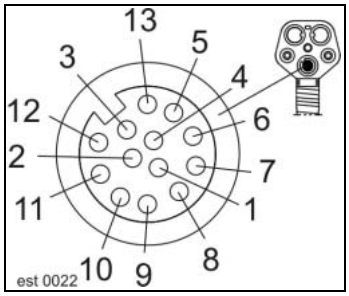
Socket R1 (A38)



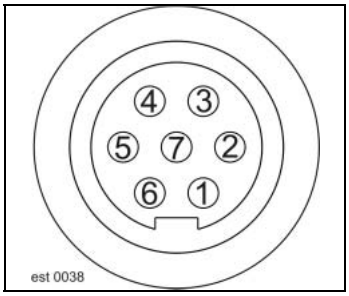
Connector XA



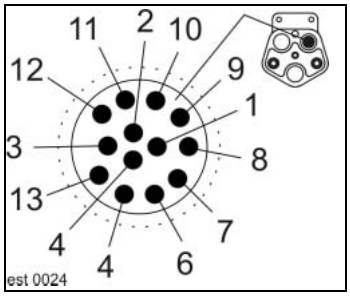
Socket XA



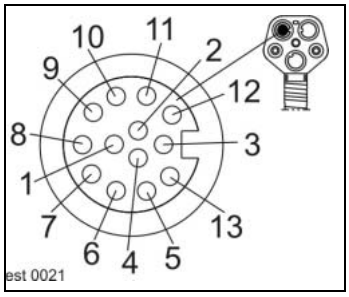
Socket XD



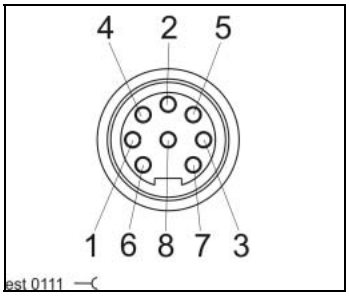
Connector XB



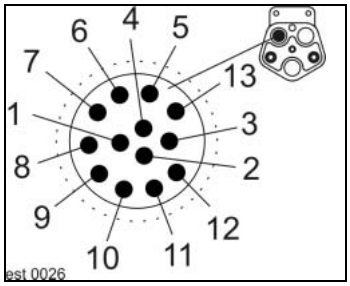
Socket XB



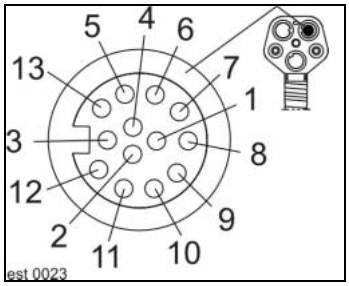
Connector XD2



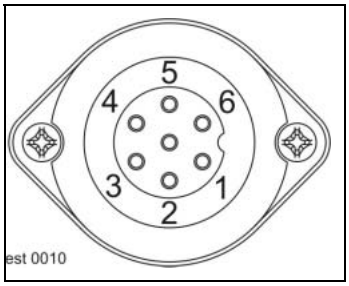
Connector XC



Socket XC



Socket XV3



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A35-1						1.5	rd-wh
A35-14						1.5	br
A35-15						1.5	rd-wh
A35-23						1.0	ye
A35-24						1.0	br-bl
A35-25						1.0	wh-pi
A35-26						1.0	br-bl
A35-28						1.5	br
A35-29						1.0	rd-bk
A35-37						1.0	bk-bl
A35-38						1.0	wh-or
A35-39						1.0	bk-or
A35-40						1.0	wh-vi
A40-13						0.75	ye
A40-14						1.5	rd-bk
A40-27						0.75	wh-or
A40-28						1.5	br
A40-40						0.75	or
A40-41						0.75	gr
A41-1						1.0	bk-bl
A41-2						1.0	br-bl
A41-3						0.75	wh-or
A41-4						0.75	gr
B2	F17 a	MO 5	SL 14			1.5	bk-bl
B 13	A10 40	A12 3	MP 3	A16 3	A8 3	1.0	or
	MO 7	E 31	MU 3	MV 3	MW 3		
	A28 3	MR 3	SL 4	A25 3	A45 3		
	DS 62	A 19					
B 14	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A 20	A10 13	A12 16	MP 4	A16 16		
	MO 4	E 30	MU 4	MV 4			
B24	B 24	F03 a	MU 1			1.5	bk
B25	31 Earth					1.5	br-bl

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E1	31 Earth					1.5	br
E12	31 Earth					1.5	br
E13	F77 a					1.5	bk-bl
E30	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
E31	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A 19	A10 40	A12 3	MP 3	A16 3		
E36	31 Earth					1.5	br
MO4	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MO5	F17 a	B 2	SL 14			1.0	bk-bl
MO7	A 19	A10 40	A12 3	MP 3	A16 3	1.0	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MO8	31 Earth						
MP 1	F09 a						
MP2	31 Earth						
MP3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MP4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MR1	A28 15	F54 a					
MR2	31 Earth						
MR3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MR4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
MU1	B 24	F03 a					
MU2	31 Earth						
MU3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MU4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV2	31 Earth						
MV3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MV4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV5	F57 a						
MW 1	F02 a	MV 1	A25 15				
MW2	31 Earth						
MW3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	A45 3					
MW4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	A45 9					

Interconnection list:

von	to 1	to 2	to 3	to 4	to 5	mm²	Colour
SL4	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	A45 3	A25 3		
	MW 3	A8 3					
SL5	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	MW 4	A25 16		
	A8 16	A45 9					
SL14	F17 a	MO 5	B 2			0.75	bk-bl
SL21	31 Earth					2.5	br
X1	31 Earth					2.5	br
X12	31 Earth					2.5	br

06t

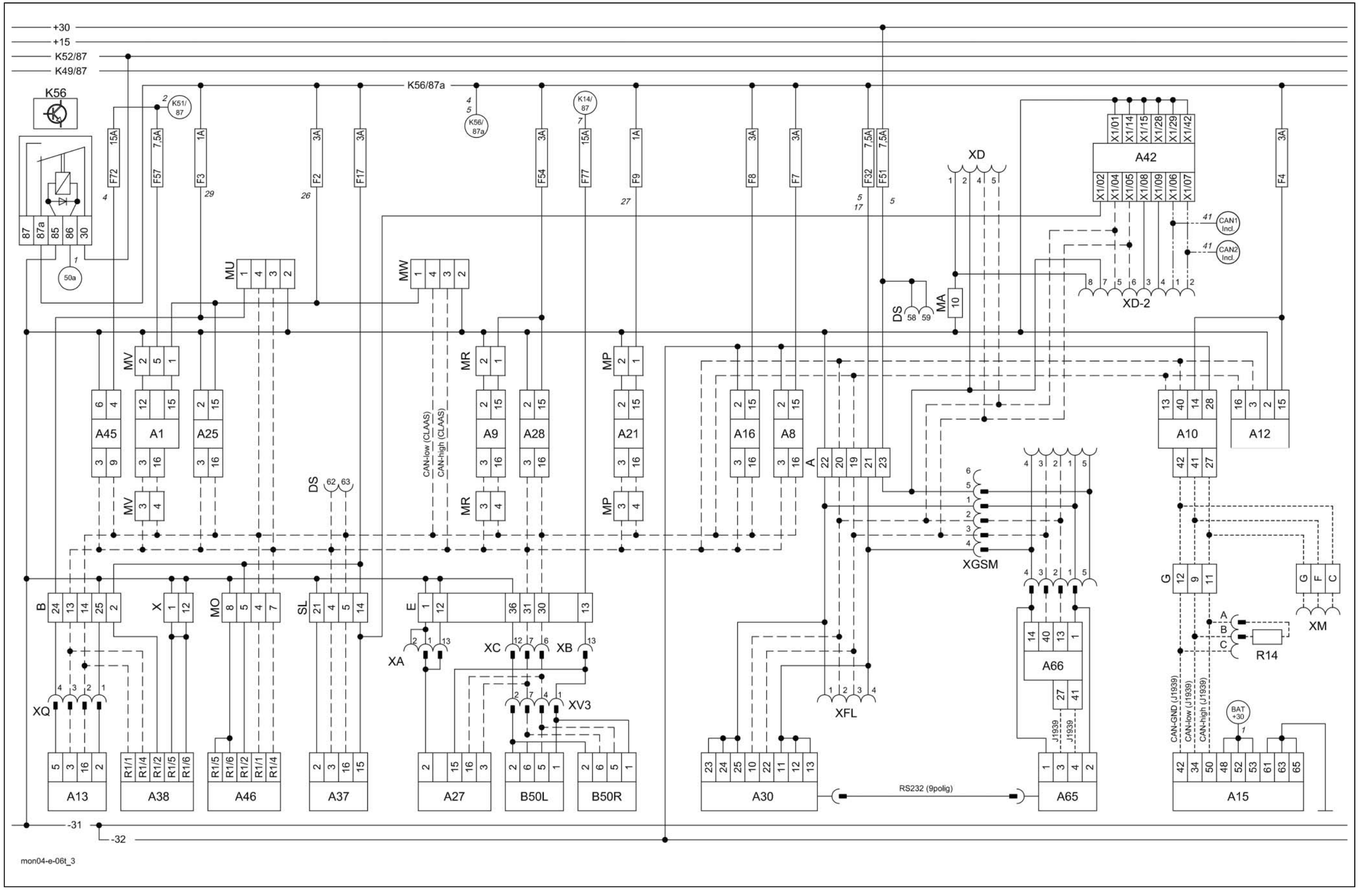
CAN bus, module power supply

Montana 570-520

- with integrated MONTANA control unit

- from serial no. 581 00027 to 581 00037

06t CAN bus, module power supply, Montana 570-520 - with integrated MONTANA control unit
(from serial no. 581 00027 to 581 00037)



Key to diagram: Coordinates

A1	AGROCOM terminal	2-i-17
A8	AUTOCONTOUR module (CAC)	2-i-20
A9	AUTOPILOT module	2-i-20
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A13	Performance monitor module (DKG)	4-p-20
A15	Electronic engine control module	3-p-18
A16	Reel controller module (HAS)	2-i-20
A21	YIELD METER module (LEM)	2-i-20
A25	Sieve adjustment module	2-i-20
A27	VARIO module	8-f-20
A28	Uni-spreader module (VGS)	2-i-20
A30	Terminal	3-g-17
A38	Rotor RIO module (RIO)	4-n-20
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
A42	MONTANA GEN II module	3-h-17
A46	Deflector adjustment module (RIO)	5-t-16
A51	Radial spreader module	5-s-18
A65	GPS pilot terminal	3-g-17
A66	GPS pilot module (GPB)	3-g-17
B50 L	AUTOPILOT laser sensor, left	6-e-25
B50 R	AUTOPILOT laser sensor, right	6-e-11
CAN-Incl.	Inclinometer CAN line	
DS	Diagnosis plug (63-pin) VIA	3-i-20
XM	Caterpillar diagnosis connector	4-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
K51	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
R14	CAN bus matching resistor	3-q-18
XFL	External CAN bus connection (e.g. flagging box, Agrocom terminal, etc.)	3-h-17
XGSM	External CAN bus connection (e.g. GSM modem)	3-h-17
XQ	Performance monitor connector	5-p-20
XA	Multifunction coupling A connector	7-f-20
XB	Multifunction coupling B connector	7-f-20
XC	Multifunction coupling C connector	7-f-20
XD	CAN bus terminal connector (7-pin)	3-g-17
XD-2	CAN bus connector (8-pin)	4-i-17
XV3	AUTOPILOT variant plug connector	7-f-20

Measured value table:

Item	Component	Measured value	Remark
R14	Resistor	approx. 120 Ω	
K56	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)

Description of function: 1/2

CAN bus
(Controller Area Network)

Data exchange between electronic components via a serial network.

- Measured value table CAN bus (50 kB)

CAN high (U_{eff})	CAN low (U_{eff})	Diagnosis
1.9 ± 0.2 Volt	3.2 ± 0.2 Volt	System OK
approx. 2.5 Volt	approx. 2.5 Volt	Short-circuit CAN high / CAN low
approx. 1.9 Volt	> 3.2 Volt	Short-circuit CAN high / +12 Volt
approx. 2.5 Volt	< 3.2 Volt	Short-circuit CAN high / Earth
> 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / +12 Volt
< 1.9 Volt	approx. 3.2 Volt	Short-circuit CAN low / Earth

Measured value table MONTANA CAN bus (250 kB)

CAN-high	CAN-low	Diagnosis
2.52 V ± 0.1 V eff.	2.49V ± 0.1 V	System OK
2.50 V	2.50 V	Short circuit CAN high to CAN low
13.62 V	>2.50 V	Short circuit CAN high to +12 Volt
0 V	<2.5 V	Short circuit CAN high against earth
>2.50 V	13.62 V	Short circuit CAN low to +12 Volt
<2.50 V	0 V	Short circuit CAN low against earth

BIF/CAB module (A10)

The abbreviation BIF stands for the German "Bordinformator" (Fieldwork computer), the abbreviation CAB for CAN bridge.
The essential machine data (serial no., operating hours, etc.) are stored in this module = BIF.
At the same time, this module constitutes the interface between different CAN bus systems (CLAAS - Caterpillar - Daimler/Chrysler) = CAB.

Data storage

All yield data is saved in the yield meter module (A21) whereas all other performance data is saved in the fieldwork computer / CAN bridge module (A10). It is therefore recommended to transmit these data prior to replacing a defective module, using the diagnosis system CDS.

MONTANA control unit (axle and front attachment control system)

The MONTANA control system includes the axle control system and a front attachment control system complementing the CLAAS AUTO-CONTOUR system (CAC).

The axle control system varies the height of the final drives of the rear axle. For tilting the machine to one side, first the uphill side is lowered and then the downhill side is raised.
The MONTANA front attachment control system allows varying the swing angle (cross levelling) and the cutting angle by adjusting the front attachment frame, in addition to the CAC functions.

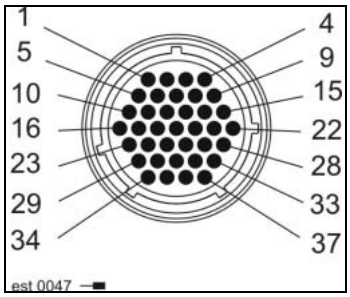
The electronic control of the MONTANA functions is via a separate CAN bus. The CAN data are converted in the MONTANA GEN II module (A42) and made available to the CLAAS CAN bus system.
According to the axle position, the value of the feed rake conveyor position sensor (B35) is offset in the AUTOCONTOUR module (CAC). This allows working in hilly ground with the CAC function "Pre-set cutting height control" and area counting.

Description of function: 2/2

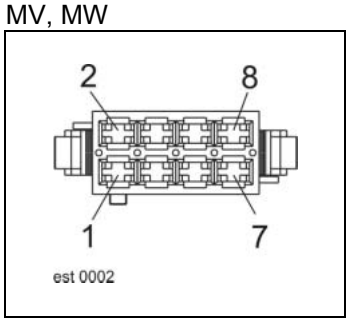
AUTOCONTOUR (CAC) Settings for Montana machines	The adaptation of the AUTOCONTOUR (CAC) and the axle control systems requires special settings for Montana machines.
- Cutterbar spring setting	The 5 mm cutterbar spring setting (see also Operator's Manual) must be made at a 50 % axle position.
- Check of cutterbar spring setting	Check setting dimension when travelling downhill with the axle cylinders fully extended. This dimension may be only < 15 mm.
- Learning the CAC limit stops	The limit stops of the CAC sensors must be learned at a 75 % axle position. While doing this, the cutting angle must be adjusted to the working position (cutterbar table surface in parallel with the ground).
- CAC sensitivity	The recommended CAC sensitivity for use with the grain cutterbar is 45 % with Montana machines.
- Drop rate setting (front attachment)	The drop rate must be adjusted with the machine at operating temperature and 50 % axle position. The drop rate is 5 – 6 seconds from the top to the bottom position.
- Set value adjustment of CAC cutting height control	When working in the field, the cutting height control set value (working within the sensor band range) should not be set higher than position 8.

Connector pin definition:

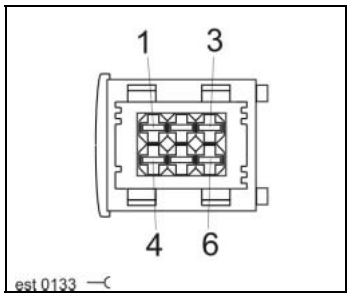
Connector B, E



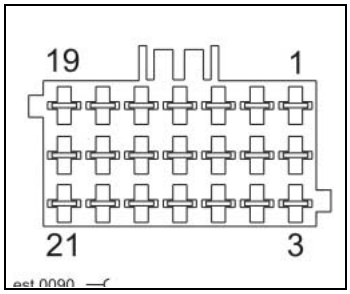
Socket MO, MP, MR, MU, MV, MW



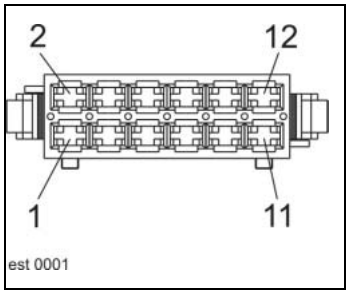
Socket R1 (A38, A46)



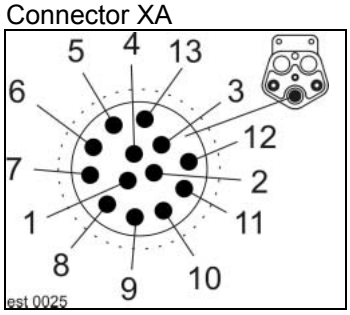
Socket SL



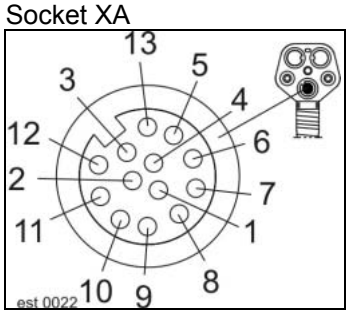
Socket X



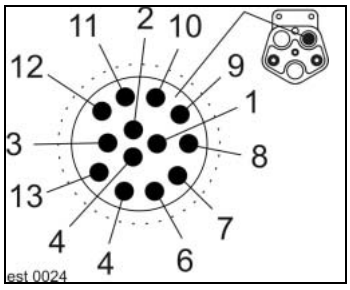
Connector XA



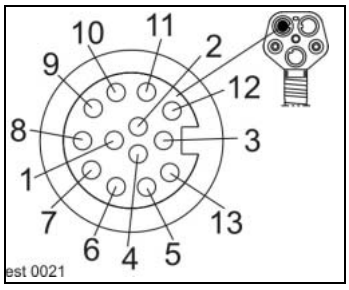
Socket XA



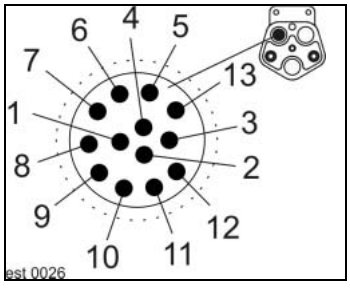
Connector XB



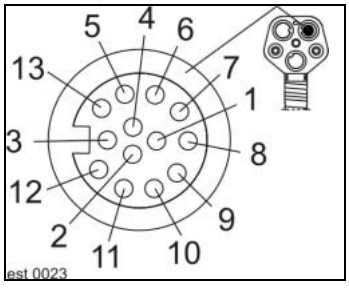
Socket XB



Connector XC

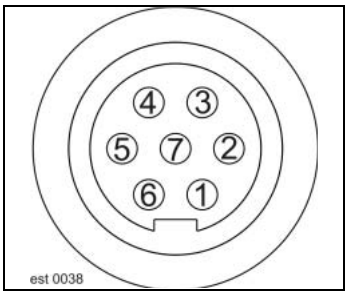


Socket XC

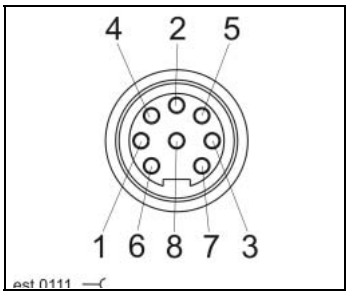


Connector pin definition:

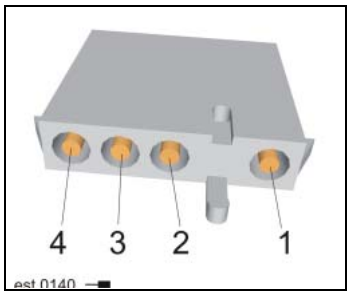
Socket XD



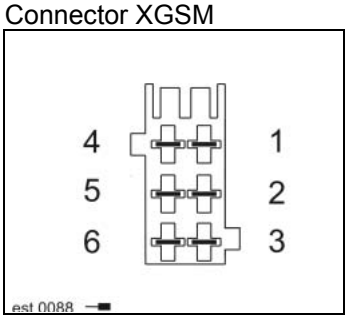
Connector XD2



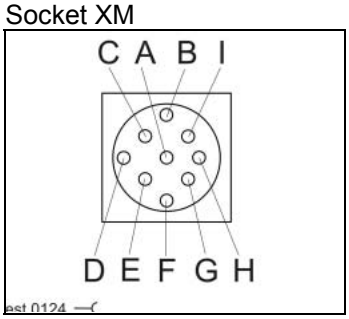
Connector XFL



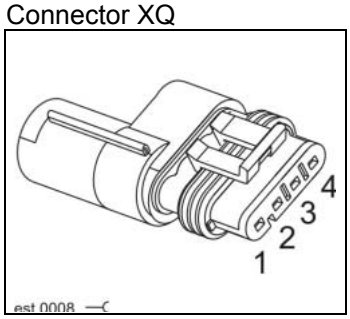
Connector XGSM



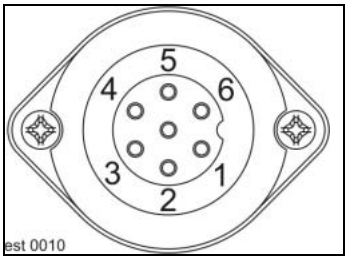
Socket XM



Connector XQ



Socket XV3



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A42 X1/01						1.5	br
A42 X1/02						1.0	bk-bl
A42 X1/04						0.75	ye
A42 X1/05						0.75	or
A42 X1/06						1.0	ye-wh
A42 X1/07						1.0	or-wh
A42 X1/08						1.0	ye-bl
A42 X1/09						1.0	or-bl
A42 X1/14						1.5	br
A42 X1/15						1.5	br
A42 X1/28						1.5	br
A42 X1/29						1.5	br
A42 X1/42						1.5	br
B2	F17 a	MO 5	SL 14			1.5	bk-bl
B 13	A10 40	A12 3	MP 3	A16 3	A8 3	1.0	or
	MO 7	E 31	MU 3	MV 3	MW 3		
	A28 3	MR 3	SL 4	A25 3	A45 3		
	DS 62	A 19					
B 14	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A 20	A10 13	A12 16	MP 4	A16 16		
	MO 4	E 30	MU 4	MV 4			
B24	B 24	F03 a	MU 1			1.5	bk
B25	31 Earth					1.5	br-bl

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E1	31 Earth					1.5	br
E12	31 Earth					1.5	br
E13	F77 a					1.5	bk-bl
E30	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
E31	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A 19	A10 40	A12 3	MP 3	A16 3		
E36	31 Earth					1.5	br
MA10						1.5	br
MO4	A 20	A10 13	A12 16	MP 4	A16 16	1.0	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MO5	F17 a	B 2	SL 14			1.0	bk-bl
MO7	A 19	A10 40	A12 3	MP 3	A16 3	1.0	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MO8	31 Earth						
MP 1	F09 a						
MP2	31 Earth						
MP3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MP4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				

Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MR1	A28 15	F54 a					
MR2	31 Earth						
MR3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MR4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
MU1	B 24	F03 a					
MU2	31 Earth						
MU3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MU4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV2	31 Earth						
MV3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	MW 3	A45 3				
MV4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	MW 4	A45 9				
MV5	F57 a						
MW 1	F02 a	MV 1	A25 15				
MW2	31 Earth						
MW3	A 19	A10 40	A12 3	MP 3	A16 3		
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	SL 4	A25 3		
	A8 3	A45 3					
MW4	A 20	A10 13	A12 16	MP 4	A16 16		
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	SL 5	A25 16		
	A8 16	A45 9					

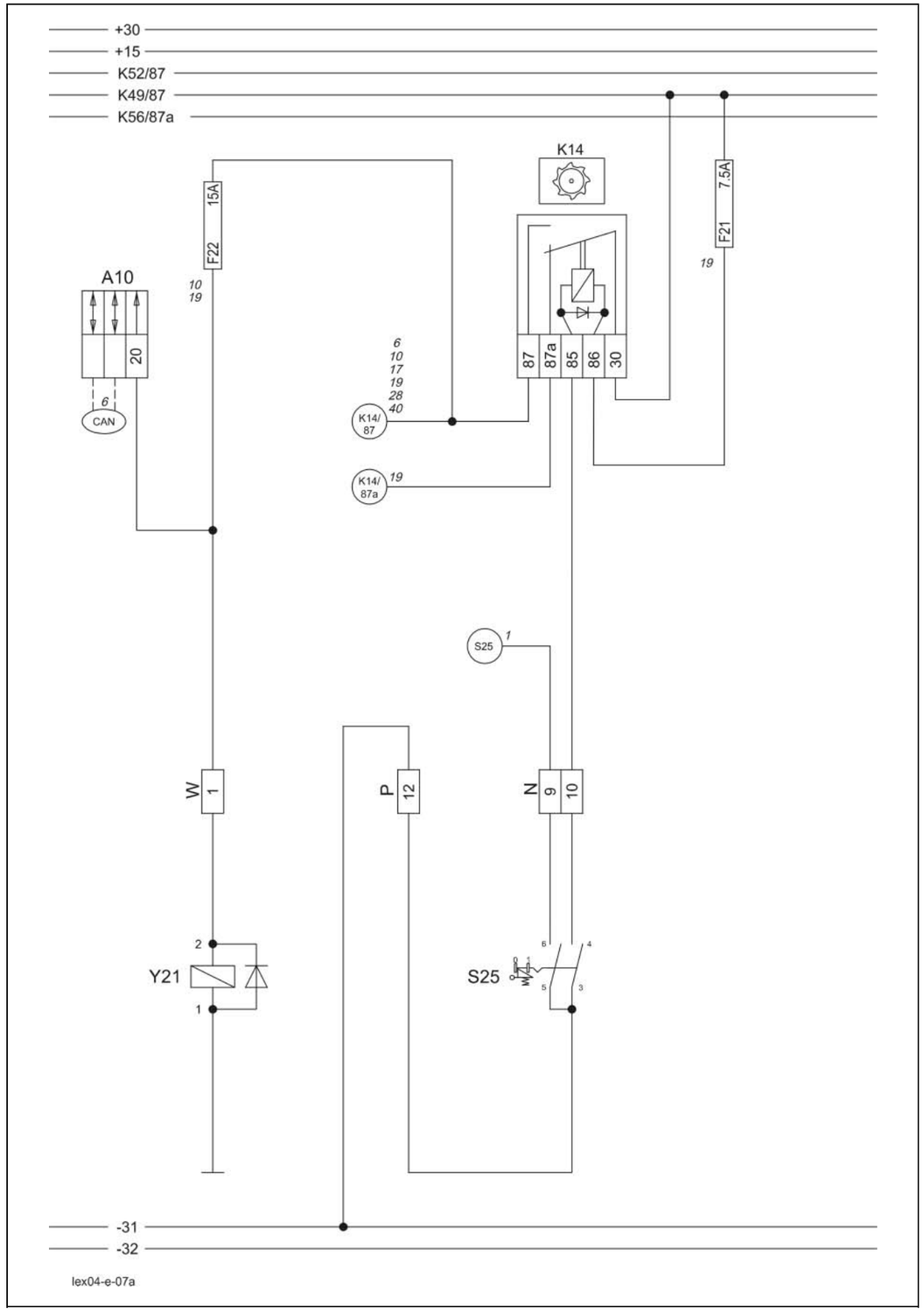
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
SL4	A 19	A10 40	A12 3	MP 3	A16 3	0.75	or
	B 13	MO 7	E 31	MU 3	MV 3		
	DS 62	A28 3	MR 3	A45 3	A25 3		
	MW 3	A8 3					
SL5	A 20	A10 13	A12 16	MP 4	A16 16	0.75	ye
	B 14	MO 4	E 30	MU 4	MV 4		
	DS 63	A28 16	MR 4	MW 4	A25 16		
	A8 16	A45 9					
SL14	F17 a	MO 5	B 2			0.75	bk-bl
SL21	31 Earth					2.5	br
X1	31 Earth					2.5	br
X12	31 Earth					2.5	br

7a

Threshing mechanism circuit

07a Threshing mechanism circuit



Key to diagram: Coordinates

A10	Fieldwork computer module (BIF/CAB)	3-I-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
S25	Main drive switch (threshing mechanism clutch)	3-h-17
Y21	Threshing mechanism clutch solenoid coil	2-p.20

Measured value table:

Item	Component	Measured value	Remark
K14	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y21	Solenoid coil	0.75 A / 16 Ω	See inscription

Description of function:

Threshing mechanism circuit

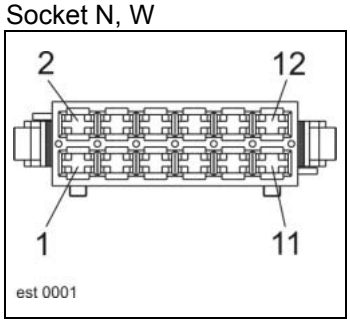
Relay K58 must be actuated by the alternator (G2) and relay K49 must be actuated by unlocking the road travel switch (S52) as pre-conditions for the threshing mechanism drive.

The threshing mechanism clutch switch (S25) controls relay K14 and supplies solenoid coil (Y21) with power.

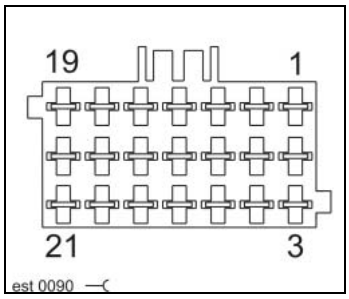
The fieldwork computer module (A10) reads in the Threshing mechanism ON signal (working hours counter, release of front attachment circuit, Autopilot circuit, fan circuit, straw chopper circuit).

Connector pin definition:

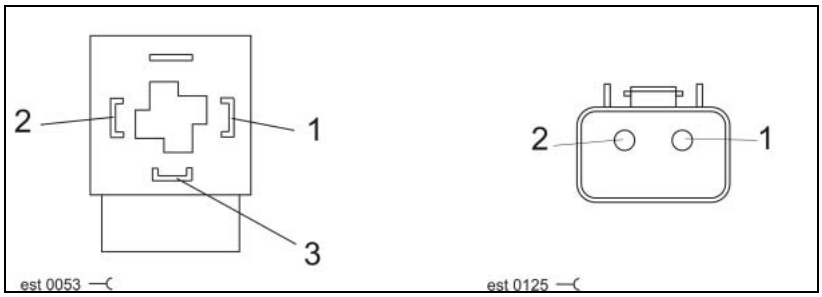
Socket N, W



Socket P



Socket Y21



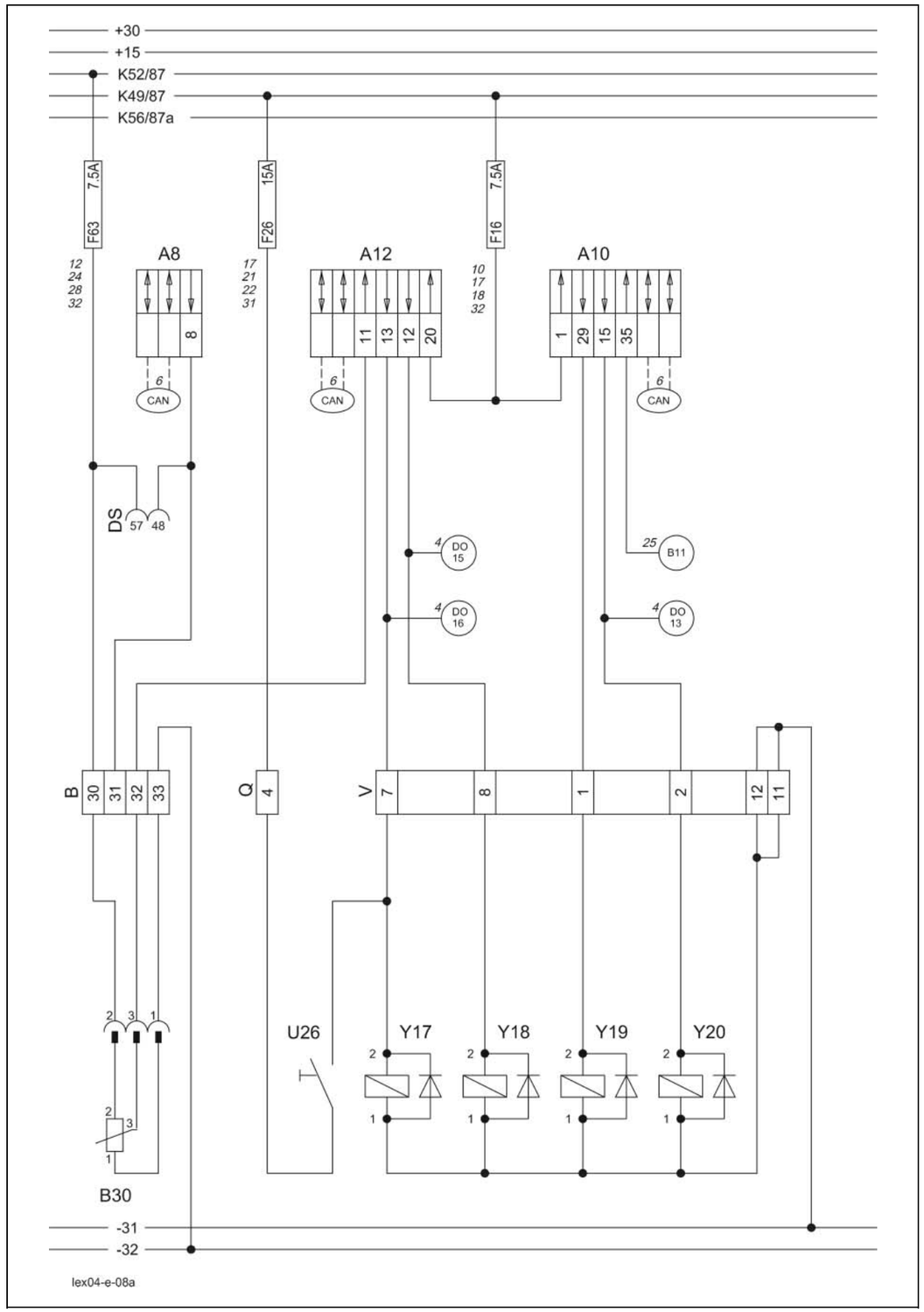
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
N 9	K13/85					0.5	rd-vi
N 10	K14/85					0.5	gr-bl
P 12	-31					2.5	br
W 1	F22 a	K63 86	MN 2	A10 20	DS 52	1.0	ye-bl

08a

Concave adjustment /
Threshing drum variable-speed drive

08a Concave adjustment / Threshing drum variable-speed drive



Key to diagram:

		Coordinates
A8	AUTOCONTOUR module (CAC)	2-i-20
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
B11	Threshing drum speed sensor	5-i-16
B30	Concave position sensor	4-l-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
U26	Fill accumulator switch *	5-n-20
Y17	Concave narrow solenoid coil	5-m-20
Y18	Concave wide solenoid coil	5-m-20
Y19	Threshing drum variable-speed drive slow solenoid coil	5-m-20
Y20	Threshing drum variable-speed drive fast solenoid coil	5-m-20

Note:

* Important! Switch U26 (Fill accumulator) has only a function on machines with hydro-pneumatic concave overload system.

Measured value table:

Item	Component	Measured value	Remark
B30	Sensor	12 V 0.25 V – 4.75 V	(Pin 1-2) (Pin 1-3)
Y17 Y18 Y19 Y20	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function: 1/2

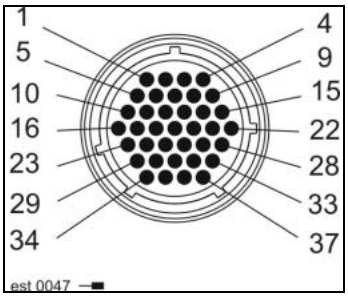
Threshing drum variable-speed drive	When the threshing mechanism is engaged, a CAN bus signal is transmitted to the fieldwork computer module A10 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the threshing drum position. The fieldwork computer module A10 controls the corresponding solenoid coils (Y19/Y20). The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the threshing drum fast solenoid coil (Y20) because this function requires that pressure is built up in the system. The fieldwork computer module (A10) ensures the actuation of the solenoid coils (Y19/Y20) and the control of the master valve (Y77) even during the automatic crop selection. The fieldwork computer module (A10) reads in the threshing drum speed actual value via sensor B11 (threshing drum speed) during automatic crop selection.
Threshing drum speed signal display	The fieldwork computer module (A10) reads in a signal from sensor B11 (threshing drum speed). The fieldwork computer module (A10) converts this signal and displays it on terminal A30 via the CAN bus.
Concave adjustment	A CAN bus signal is transmitted to the speed monitor module (DZW) A12 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the concave position. The speed monitor module A12 controls the corresponding solenoid coils (Y17/Y18). The circulation shut-off valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the two solenoid coils (Y17/Y18) because these functions require that pressure is built up in the system. The speed monitor module (A12) ensures the actuation of the solenoid coils (Y17/Y18) and the control of the circulation shut-off valve (Y77) during the automatic crop selection. The speed monitor module (A12) reads in the concave adjustment actual value via the concave position sensor B30 during automatic crop selection.

Description of function: 2/2

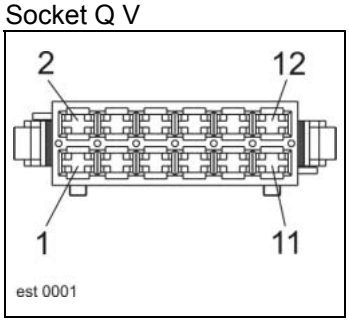
Concave display	Sensor (B30) receives the necessary 12 V reference voltage from the power supply relay K52. The speed monitor module (A12) converts the analogue signal from sensor (B30) into a digital signal which is displayed on terminal (A30) via the CAN bus.
Concave pressurising (hydro-pneumatic overload system)	In order to avoid threshing drum blocking in case of threshing mechanism overload, the concave is pressurised hydraulically to 130 bar by an accumulator. The adjustment of this hydraulic pressurisation is by the concave overload system shut-off valve (636) – Hydraulic system, chapter 3.
Reducing the pressurisation	Opening the shut-off valve (636) relieves the system pressure to the tank - the pressure falls.
Increasing the pressurisation	Opening the shut-off valve (636) in connection with actuating the Fill accumulator switch (U26) will increase the system pressure. Actuating the Fill accumulator switch (U26) is necessary to achieve a pressure build-up in the hydraulic system. After opening the concave overload system shut-off valve (636), this pressure goes into the accumulator and thus pressurises the concave hydraulically. **Note:** The pressurisation pressure of the hydro-pneumatic overload protection must be set to 130 bar.

Connector pin definition:

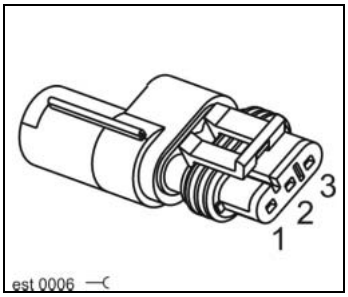
Connector B



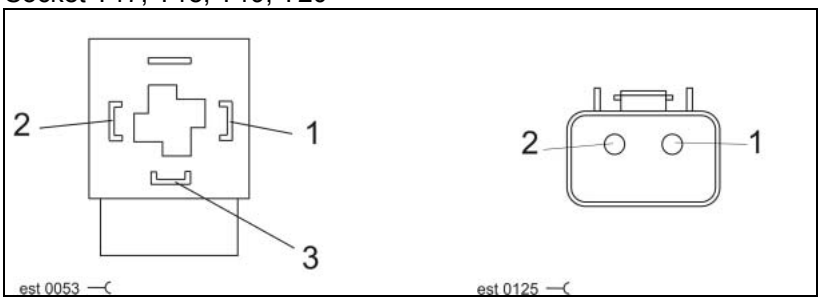
Socket Q V



Socket B30



Socket Y17, Y18, Y19, Y20



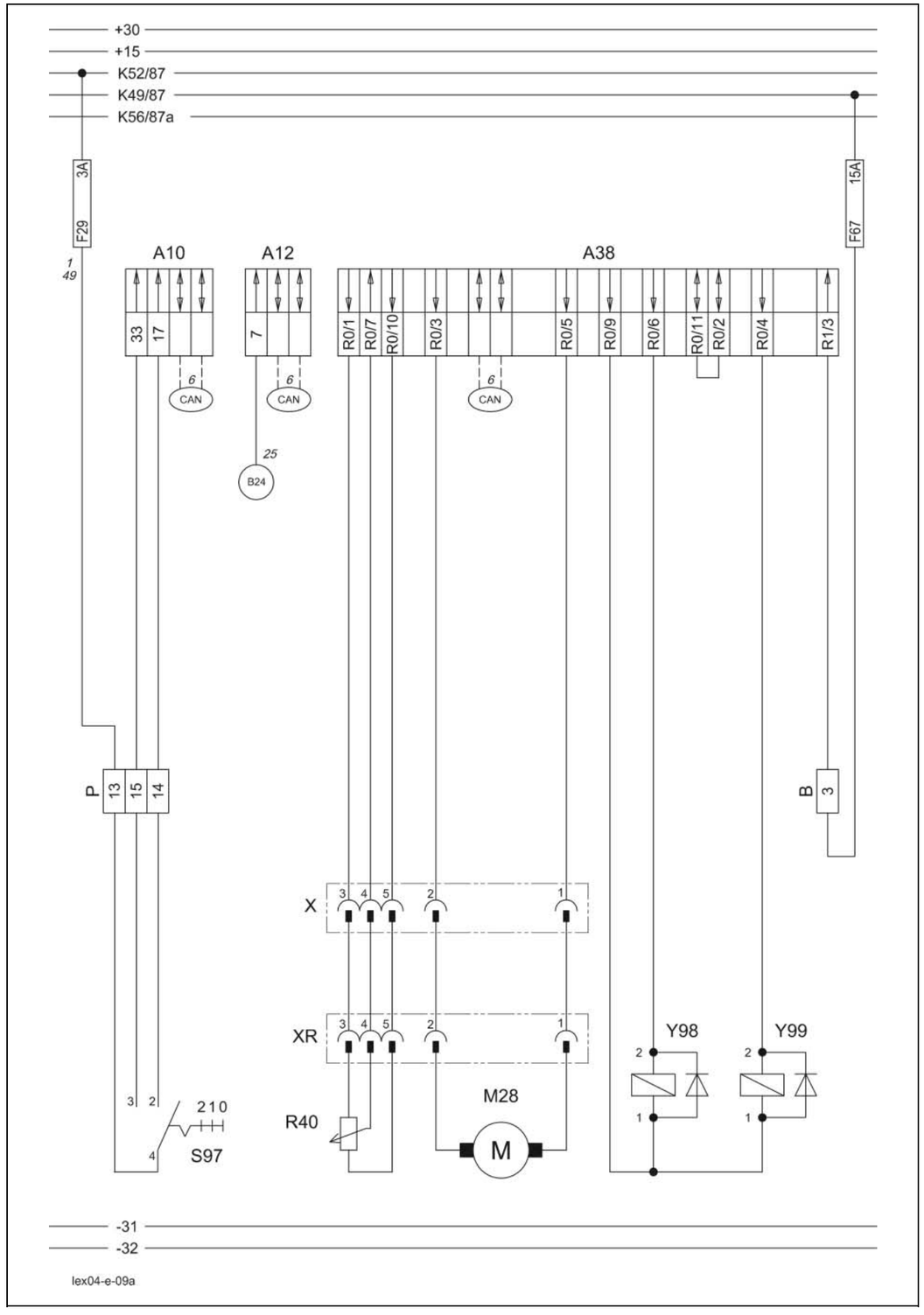
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 30	F63 a	BB 13	MR 5	MU 8	DS 57	1.0	bk-ye
B 31	A8 8	BB 10	E 25	DS 48			
B 32	A12 11	BB 11				1.0	gn-wh
B 33	BB 12	A8 2	A16 2	Q 12	A 34	1.0	pi-bl
	E 37	Bridge a	CB 2	Z 8			
Q 4	A16 20	F26 a	K1 86	K1 30	K2 86	1.0	bl-ye
	K2 30	K3 86	K3 30	K4 86	K4 30		
	A16 18						
V 1	A10 29					1.5	wh-ye
V 2	A10 15	DO 13				1.5	wh-gr
V 7	A12 13	DO 16				1.5	wh-bl
V 8	A12 12	DO 15				1.5	wh-br
V 11	-31					2.5	br
V 12	-31					2.5	br

09a

Rotor flap adjustment / Rotor variable-speed drive

09a Rotor flap adjustment / Rotor variable-speed drive



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-17
A12	Speed monitor module (DZW)	2-i-17
A38	RIO rotor module	4-m-20
B24	Rotor speed sensor	3-s-17
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
M28	Rotor flap adjustment motor	3-n-18
R40	Rotor flaps potentiometer	3-n-18
S97	Rotor concave cover switch	3-h-17
X	Rotor flaps connector	4-q-20
Y98	Rotor variable-speed drive slow solenoid coil	4-m-20
Y99	Rotor variable-speed drive fast solenoid coil	4-m-20

Measured value table:

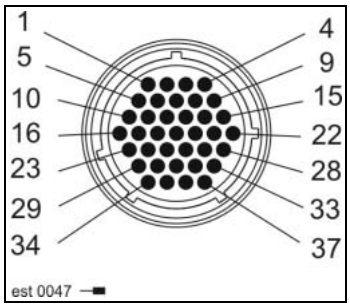
Item	Component	Measured value	Remark
B24	Digital sensor (0-I)	12 V 0.4 V – 4.6 V	Power supply (Pin 1-3) Signal (Pin 1-2) 0.4 V = LED dark = 0 4.6 V = LED bright = I
R40	Potentiometer	0.2 – 5.0 KΩ 0.15 – 4.85 V	Coil Signal
M28		5.6 A	Max. current
Y98 Y99	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

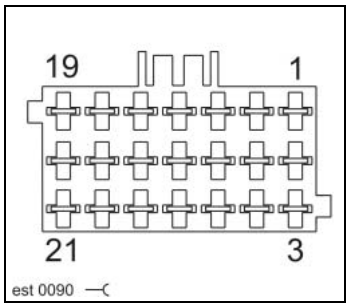
Rotor variable-speed drive	To change the rotor speed, the road travel activation switch S52 and the main drive switch (threshing mechanism clutch) S25 must be actuated. A CAN bus signal is transmitted to the rotor module A38 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the rotor position. The rotor module A38 controls the corresponding solenoid coils (Y98/Y99). The master valve (Y77) is also actuated via the CAN bus and the ground drive hydraulic motor brake restrictor (HBM) A45 in parallel with the rotor fast solenoid coil (Y99) because this function requires that pressure is built up in the system. The rotor module (A38) ensures the actuation of the solenoid coils (Y98/Y99) and in parallel with this, the actuation of the master valve (Y77) via CAN bus and the ground drive hydraulic motor brake restrictor (HBM) A45 during the automatic crop selection. The speed monitor module (DZW) A12 reads in the rotor speed actual value via the rotor speed sensor B24 during automatic crop selection.
Rotor speed display	The speed monitor module (DZW) A12 reads in a signal from the rotor speed sensor B24. The speed monitor module (DZW) A12 converts this signal and displays it on terminal A30 via the CAN bus.
Rotor flap adjustment	To adjust the rotor flaps, the road travel activation switch S52 and the main drive switch (threshing mechanism clutch) S25 must be actuated. The control unit of the flaps on the rotor concaves is actuated by the rotor concave cover switch S97. The signals from the rotor concave cover switch S97 are transmitted to the fieldwork computer module (BIF/CAB) A10. The fieldwork computer module (BIF/CAB) A10 converts these signals into a corresponding CAN bus command to the rotor module A38. This module controls the rotor flap adjustment motor M28 until the set position selected at the rotor concave cover switch S97 corresponds to the actual position detected by the integrated rotor flap potentiometer R40.

Connector pin definition:

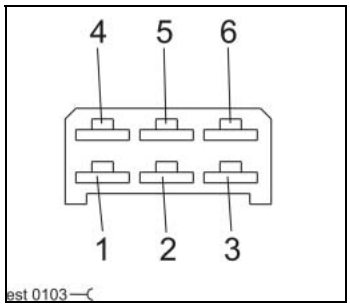
Connector B



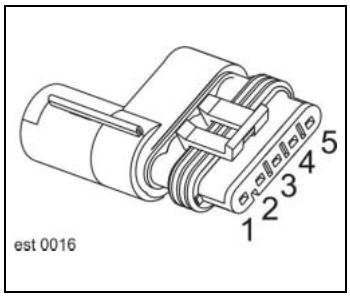
Socket P



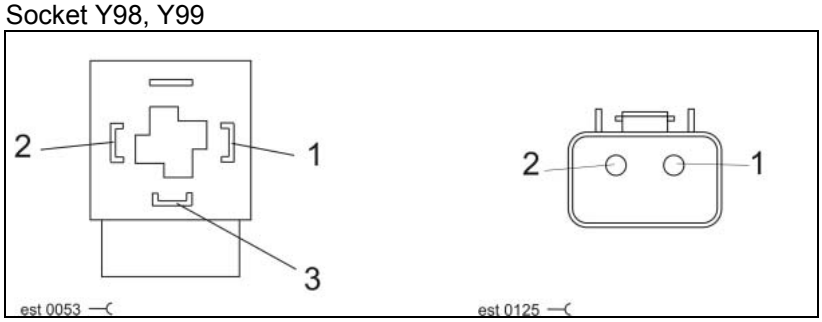
Socket XR



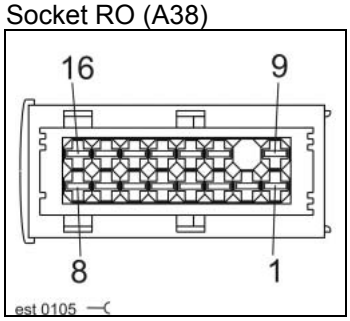
Socket X



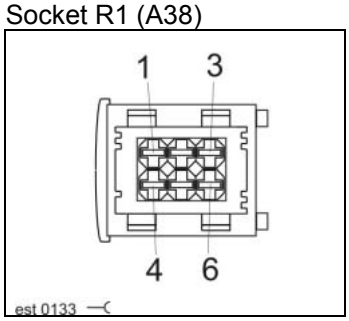
Socket Y98, Y99



Socket RO (A38)



Socket R1 (A38)



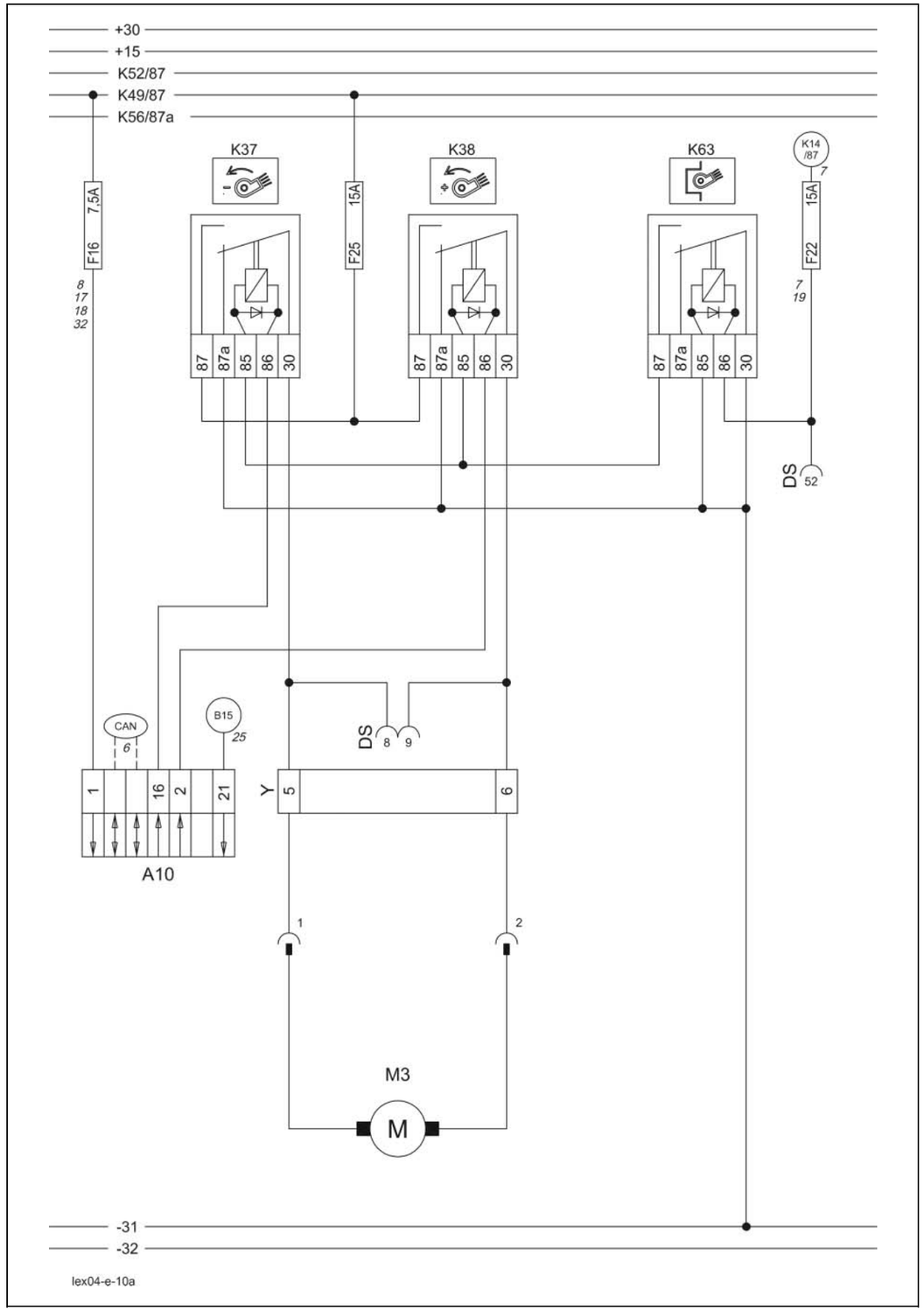
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 3	F67 a					1.5	bk-vi
P 13	F29 a					1.5	bk
P 14	A10 17					1.0	bl-or
P 15	A10 33					1.0	bl
XR -1						1.5	wh-bl
XR -2						1.5	wh-rd
XR -3						0.75	gn-gr
XR -4						0.75	gn
XR -5						0.75	gn-br
X-1						1.0	wh-rd
X-2						1.0	wh-bl
X-3						1.0	gn-gr
X-4						1.0	gn
X-5						1.0	gn-br

10a

Fan variable-speed drive

10a Fan variable-speed drive



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
B15	Fan speed sensor	7--k-16
DS	Diagnosis plug (63-pin) VIA	3-i-20
K14	Threshing mechanism relay	4-i-20
K37	Fan speed adjustment slow relay	4-i-20
K38	Fan speed adjustment fast relay	4-i-20
K49	Road travel main relay	4-i-20
K63	Fan speed adjustment lock relay	4-i-20
M3	Fan speed adjustment motor	5-l-16

Measured value table:

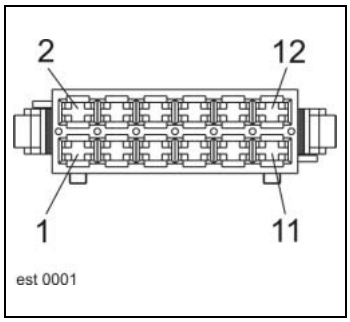
Item	Component	Measured value	Remark
K63	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K38 K39	Remote control relay 40 A changeover contact	90±10 Ω	(Pin 86/1 – 85/2)
M 3	Electric motor	14 A	Max. current

Description of function:

Fan variable-speed drive	When the threshing mechanism is engaged, relay K14 actuates relay K63, thus supplying relays K37 and K38 with earth at pin 85. A CAN bus signal is transmitted to the fieldwork computer module (BIF/CAB) A10 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the fan position. The fieldwork computer module (BIF/CAB) A10 actuates the corresponding relay K37 or K38 via pin 86. The fan speed adjustment electric motor (M3) is supplied with earth according to the sense of rotation by one of the relays K37/K38 from pin 87a whereas the other relay K37/K38 controls the voltage on pin 87. The fieldwork computer module (A10) ensures actuation of the relays K37 and K38 during automatic crop selection. The fieldwork computer module (A10) reads in the fan speed actual value via fan speed sensor B15 during automatic crop selection.
Fan speed display	The fieldwork computer module (A10) reads in a signal from sensor B15 (fan speed). The fieldwork computer module (A10) converts this signal and displays it on terminal A30 via the CAN bus – see also diagram 25a.

Connector pin definition:

Socket Y



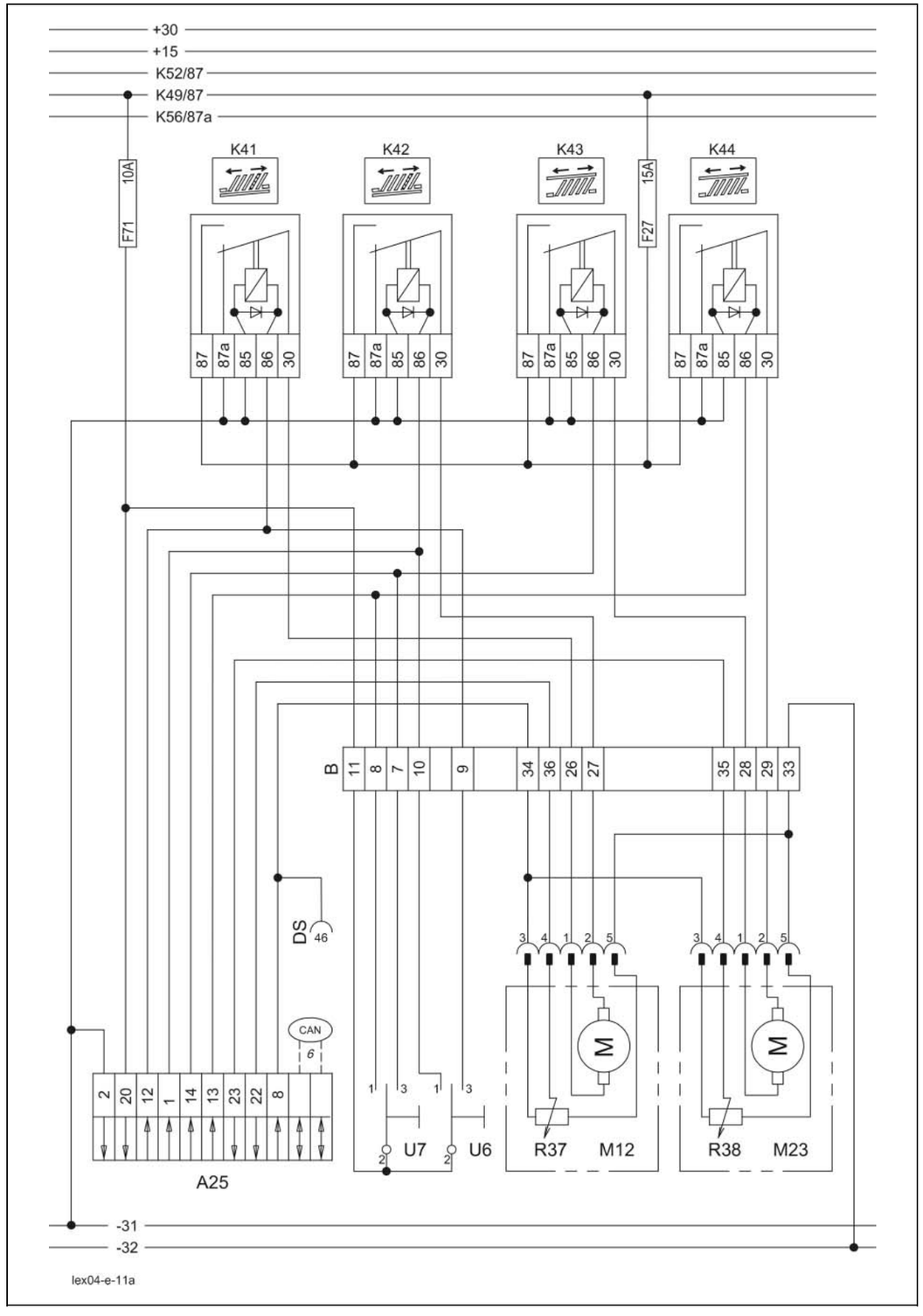
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
Y 5	K37 30	DS 8				2.5	wh-ye
Y 6	K38 30	DS 9				2.5	wh-bk

11a

Sieve adjustment

11a Sieve adjustment



Key to diagram:

Coordinates

A25	Sieve adjustment module	2-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K41	Upper sieve adjustment relay (close)	4-i-20
K42	Upper sieve adjustment relay (open)	4-i-20
K43	Lower sieve adjustment relay (close)	4-i-20
K44	Lower sieve adjustment relay (open)	4-i-20
K49	Road travel main relay	4-i-20
M12	Upper sieve adjustment motor	6-q-18
M23	Lower sieve adjustment motor	7-q-18
R37	Upper sieve adjustment potentiometer	6-q-18
R38	Lower sieve adjustment potentiometer	7-q-18
U6	Upper sieve adjustment switch	5-r-20
U7	Lower sieve adjustment switch	5-r-20

Measured value table:

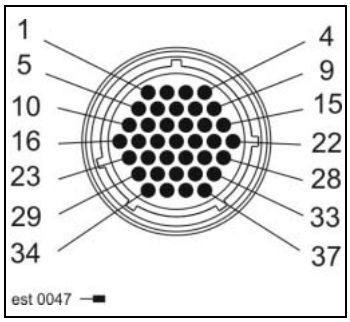
Item	Component	Measured value	Remark
K41 K42 K43 K44	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
M12 M23	Electric motor	2.5 A max.	
R37 R38	Potentiometer	0.5 - 5.2 KΩ 0.45 - 4.55 V	Coil Signal

Description of function:

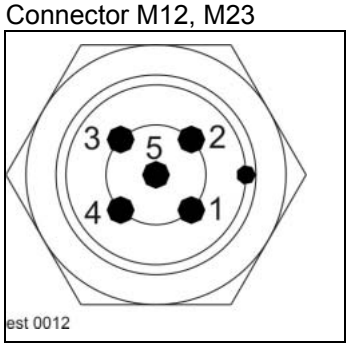
Adjustment motor circuit	A CAN bus signal is transmitted to the sieve adjustment module A25 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to a sieve position. The sieve adjustment module A25 actuates the corresponding relay K41 (K43) or K42 (K44) on pin 86. The respective sieve adjustment electric motor (M12/M23) is supplied with earth according to the sense of rotation by one of the relays K41/K42 (K43/K44) from pin 87a whereas the other relay K42/K41 (K44/K43) controls the voltage on pin 87. The sieve adjustment module (A25) ensures actuation of the relays K41 (K43) and K42 (K44) during automatic crop selection.
Sieve position display	The sieve adjustment module (A25) converts the analogue signal from potentiometers provided in the positioning motors (R37/R38) into a digital signal which is displayed on terminal (A30) via the CAN bus.

Connector pin definition:

Connector B



Connector M12, M23



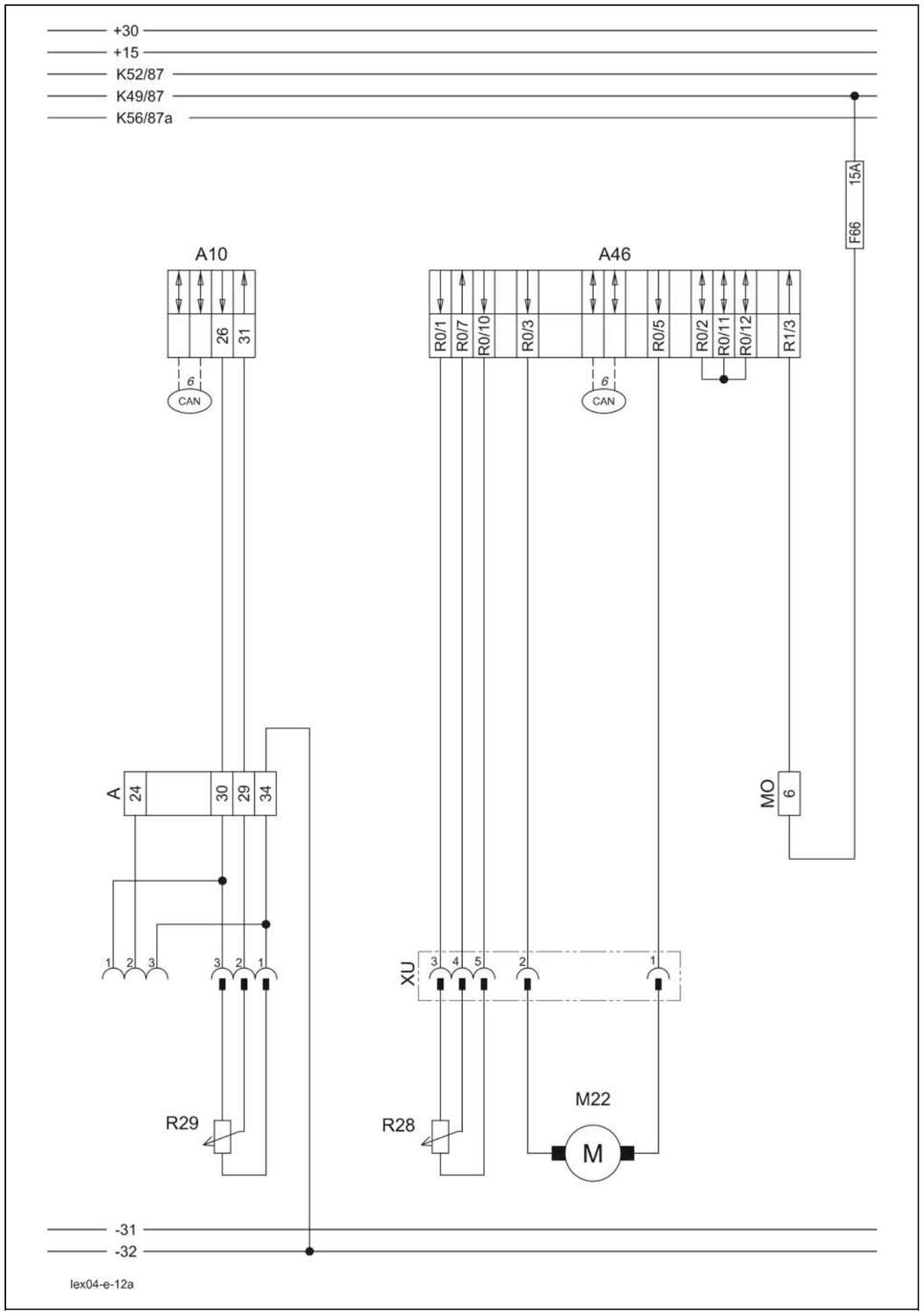
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 7	K43 86	A25 14				1.0	bl-wh
B 8	K44 86	A25 13				1.0	bl-ye
B 9	K41 86	A25 12				1.0	bl-gr
B 10	K42 86	A25 1				1.0	bl-gn
B 11	F71 a	A25 20				1.0	bl-rd
B 26	K41 30					1.5	gn-bl
B 27	K42 30					1.5	gn-vi
B 28	K43 30					1.5	gn-ye
B 29	K44 30					1.5	gn-gr
B 33	BB 12	A8 2	A16 2	Q 12	A 34		
	E 37	Bridge a	CB 2	Z 8		1.0	pi-bl
B 34	DS 46	A25 8				1.0	ye-gn
B 35	A25 23					1.0	ye-gr
B 36	A25 22					1.0	ye-rd

12a

Deflector adjustment

12a Deflector adjustment



Key to diagram: Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A46	RIO deflector adjustment module	2-i-20
K49	Road travel main relay	4-i-20
M22	Deflector adjustment motor	6-u-16
R28	Spreading direction potentiometer (actual value)	6-u-16
R29	Spreading direction potentiometer (set value)	3-h-17

Measured value table:

Item	Component	Measured value	Remark
M22	Electric motor	5.6 A	Max. current
R28	Potentiometer	0.2 – 5.0 KΩ 0.15 – 4.85 V	Coil Signal
R29	Potentiometer	4.70 KΩ 1.7 – 6.4 KΩ	(Pin A – E) Coil (Pin S – E) Slider

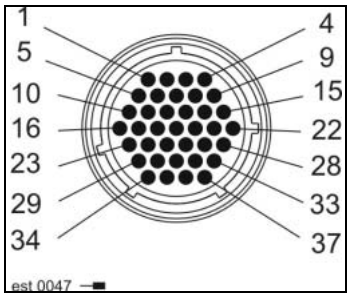
Description of function:

Adjustment motor circuit

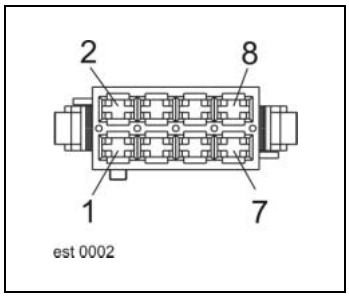
To adjust the deflector, the road travel activation switch S52 and the main drive switch (threshing mechanism clutch) S25 must be actuated. According to the setting of the set value potentiometer (R29) in the cab, the deflector adjustment module (A46) controls the positioning motor (M22) until the set value matches that of the integrated actual value potentiometer (R28).

Connector pin definition:

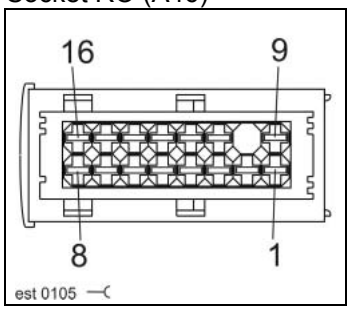
Connector A



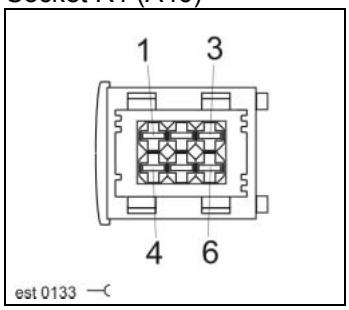
Socket MO



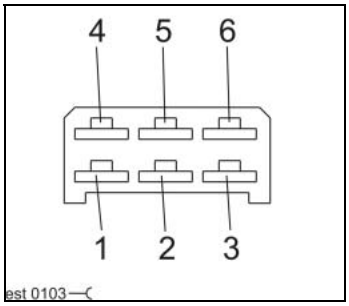
Socket RO (A46)



Socket R1 (A46)



Socket XU



Interconnection list:

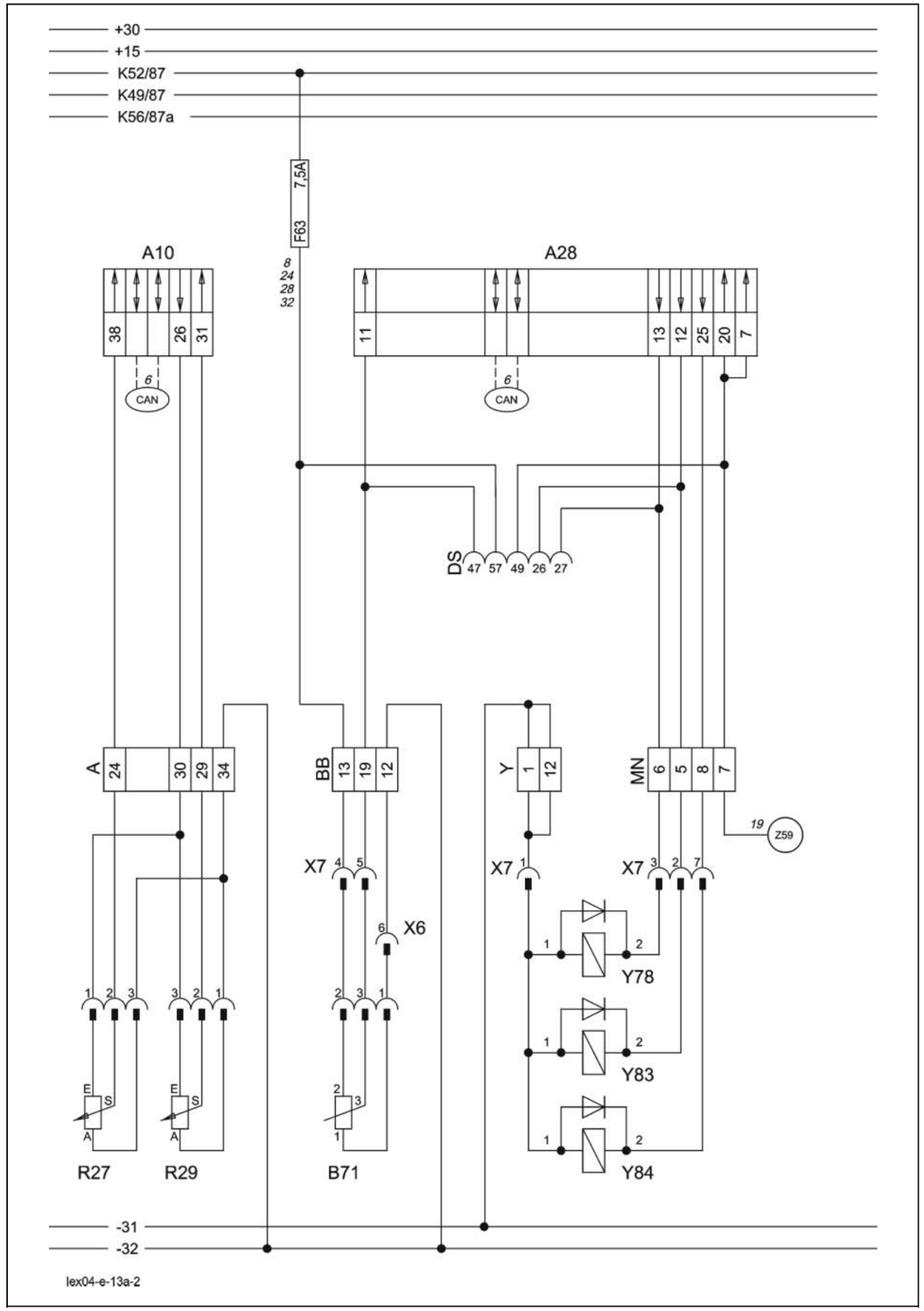
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 24	A10 38					0.35	wh-br
A 29	A10 31					0.35	gr-gn
A 30	A10 26					0.22	wh-bk
A 34	B 33	BB 12	A8 2	A16 2	Q 12	0.22	br-bk
	E 37	Bridge a	CB 2	Z 8			
MO 6	F66 a					1.5	bk-vi
XU-1						1.0	wh-rd
XU -2						1.0	wh-bl
XU -3						1.0	gn-gr
XU -4						1.0	gn
XU -5						1.0	gn-br

13a

Straw and chaff spreader

Uni-spreader - LEXION 580

13a Straw and chaff spreader, uni-spreader - LEXION 580



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A28	Uni-spreader module (VGS)	2-i-20
B71	Uni-spreader position sensor	6-t-18
DS	Diagnosis plug (63-pin) VIA	3-i-20
K52	Power supply relay	4-i-20
R27	Spreading width potentiometer (set value)	4-h-17
R29	Spreading direction potentiometer (set value)	4-h-17
X6	Straw chopper connector	5-s-17
X7	Deflector adjustment / uni-spreader connector	5-s-17
Y78	Uni-spreader master valve solenoid coil	7-s-18
Y83	Uni-spreader swing left solenoid coil	7-s-18
Y84	Uni-spreader swing right solenoid coil	7-s-18
Z59	Uni-spreader / baffle plate position actual value switch	5-s-20

Measured value table:

Item	Component	Measured value	Remark
B71	Sensor	12 V 0.25 V – 4.75 V	(Pin 1-2) (Pin 1-3)
R27 R29	Potentiometer	4.70 KΩ 1.7 – 6.4 KΩ	(Pin A – E) Coil (Pin S – E) Slider
Y78 Y83 Y84	Solenoid coil	3.8 A 3.2 Ω	See inscription

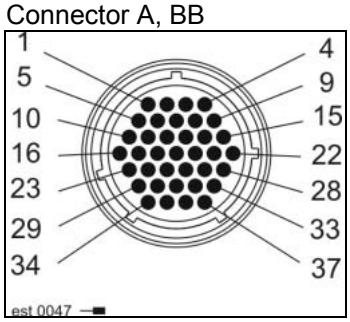
Description of function:

Uni-spreader circuit

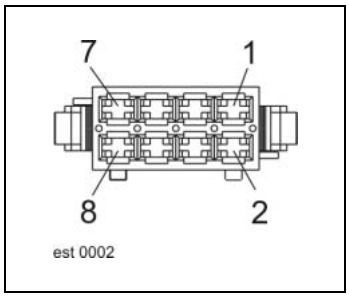
When the uni-spreader is in working position, the straw chopper / uni-spreader working position switch (Z58) is closed.
In the straw chopper position, the limit switch (Z59) is closed by swinging the straw guide plate. The uni-spreader module (A28) thus receives the signal for actuating the solenoid coils (Y83/Y84). In addition, the uni-spreader master valve (Y78) is also actuated in a modulated way in order to compensate pressure peaks during load changes.
Spreading width and spreading direction are controlled as a function of the comparison between the set value potentiometers (R27/R29) and the actual value sensor (B71). The set values and actual values are compared via the CAN bus.

Connector pin definition:

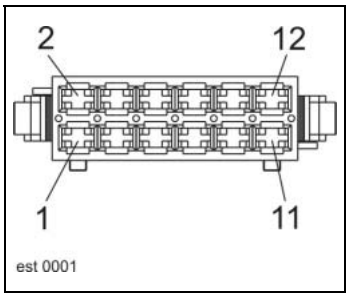
Connector A, BB



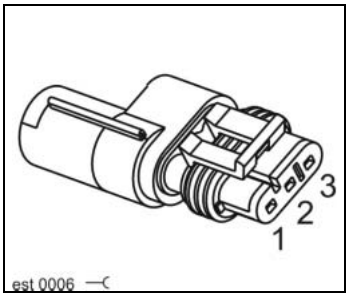
Connector MN



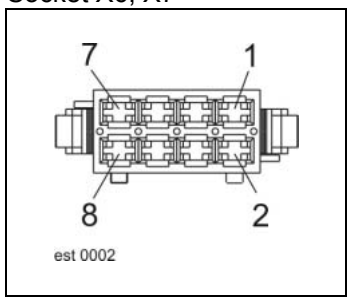
Socket Y



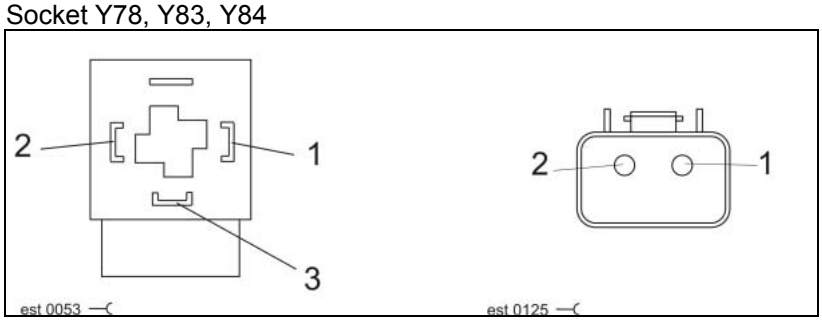
Socket B71



Socket X6, X7



Socket Y78, Y83, Y84



Interconnection list:

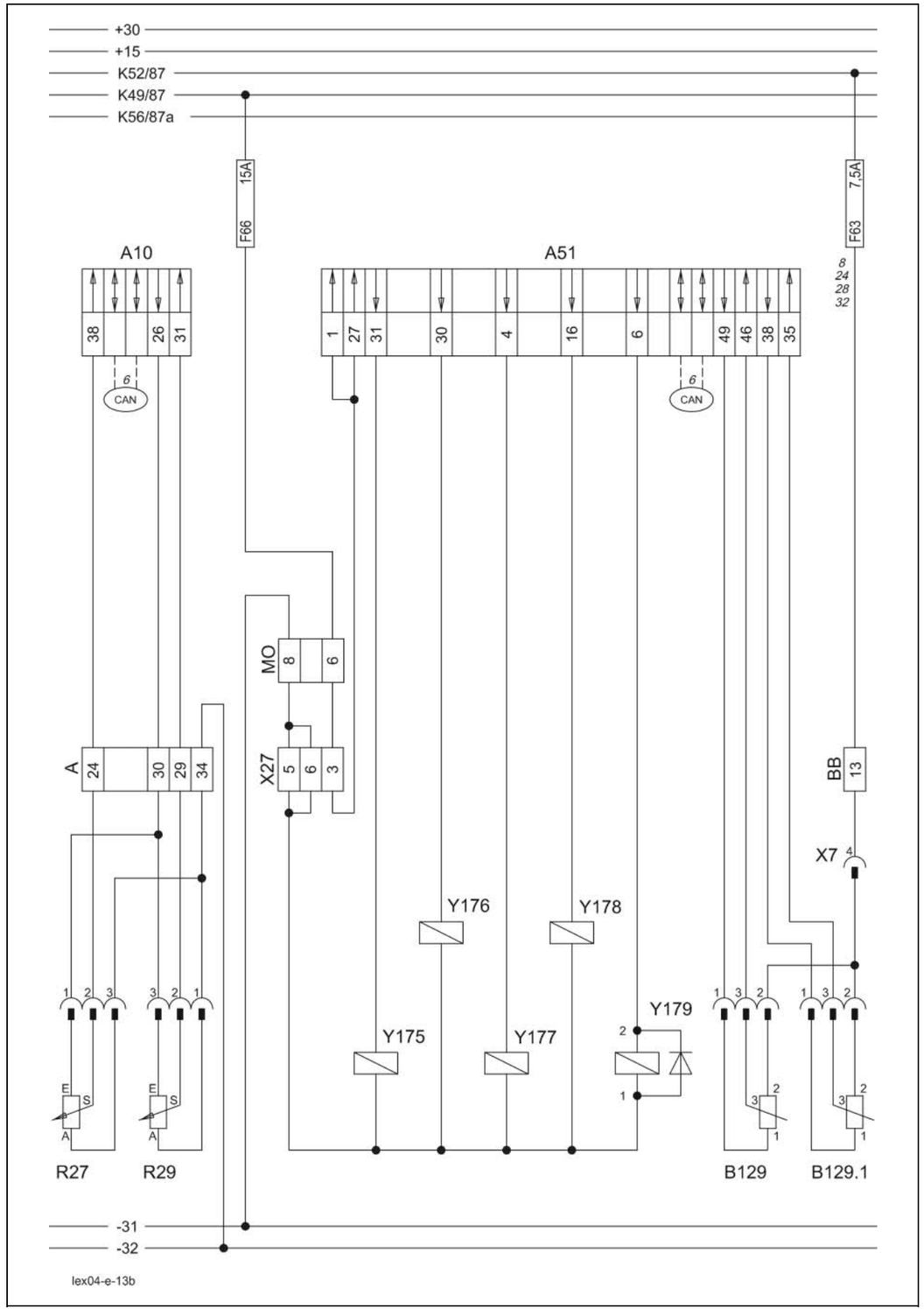
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 24	A10 38					0.35	wh-br
A 29	A10 31					0.35	gr-gn
A 30	A10 26					0.22	wh-bk
A 34	B 33	BB 12	A8 2	A16 2	Q 12		
	E 37	Bridge a	CB 2	Z 8		0.22	br-bk
BB 12	A 34	B 33	A8 2	A16 2	Q 12		
	E 37	Bridge a	CB 2	Z 8		1.5	bl
BB 13	MR 5	B 30	MU 8	DS 57	F63 a	1.0	rd-gr
BB 19	A28 11	DS 47				1.0	bl-gn
BB 34							
MN 5	DS 26	A28 12				2.5	wh-rd
MN 6	DS 27	A28 13				2.5	wh-bl
MN 7	DS 49	A28 7	A28 20			2.5	bl-wh
MN 8	A28 25					1.5	bk-or
X6-6						0.75	br-bl
X6-7						2.5	bl-wh
X7-1						1.5	br
X7-2						1.5	wh-rd
X7-3						1.5	wh-bl
X7-4						1.0	gn-gr
X7-5						1.0	gn
X7-7						1.5	bk-vi
Y 1	-31					2.5	br
Y 12	-31					2.5	br

13b

Straw and chaff spreader

Radial spreader

13b Straw and chaff spreader, radial spreader



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A51	Radial spreader module	5-s-18
B129	Deflector position right sensor	6-u-17
B129.1	Deflector position left sensor	6-u-19
K49	Road travel main relay	4-i-20
R27	Spreading width potentiometer (set value)	4-h-17
R29	Spreading direction potentiometer (set value)	4-h-17
X7	Connector deflector adjustment / uni-spreader	5-s-17
X27	Connector (deflector adjustment module A46 – RIO)	4-t-18
Y175	Swing in left radial spreader deflector	5-s-19
Y176	Swing out left radial spreader deflector	5-s-19
Y177	Swing in right radial spreader deflector	5-s-19
Y178	Swing out right radial spreader deflector	5-s-19
Y179	Solenoid valve Radial spreader deflector drive ON/OFF	5-s-19

Measured value table:

Item	Component	Measured value	Remark
B129	Sensor	12 V 0.25 V - 4.75 V	(Pin 1-2) (Pin 1-3)
R27 R29	Potentiometer	4.70 KΩ 1.7 - 6.4 KΩ	(Pin A - E) coil (Pin S - E) slider
Y175 Y176 Y177 Y178	Solenoid coil	2 - 3 Ω	proportional
Y179	Solenoid coil	5 - 6 Ω	I - 0

Description of function:

Deflector drive / radial spreader circuit

When the radial spreader is in chopping position, the actual value switch (Z58) is closed (see circuit diagram 19b).
With the threshing mechanism and straw chopper engaged (K14/87), module A51 activates the radial spreader deflector drive ON/OFF solenoid coil Y179 (see circuit diagram 7a and 19b).

The radial spreader starts spreading under program control by alternatingly activating the solenoid coils Y175, Y176, Y177 and Y178.

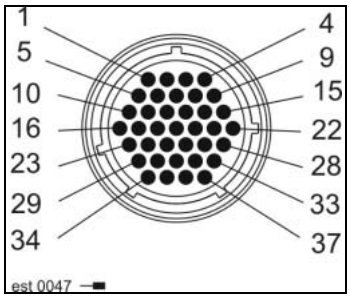
Here the radial spreader module (A51) detects the position of the deflectors via the sensors B129.
The spreading width and the spreading direction is adjusted according to the set value of the potentiometer in the operating panel (R27/R29).
The programmed parameters in module A51 are modified according to these set values via the CAN bus.

When swathing, the deflectors can be positioned so that the straw and chaff output from the cleaning stage will not be thrown into the swath, using the spreading width potentiometer (R27).

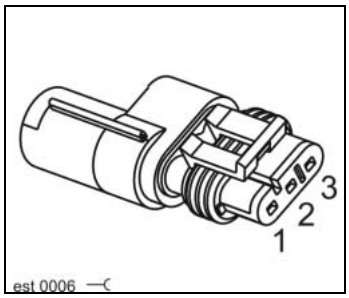
Note: Ensure that the connectors of the solenoid coils at the deflector control unit are not confused (differing current consumption – see measured value table).

Connector pin assignment:

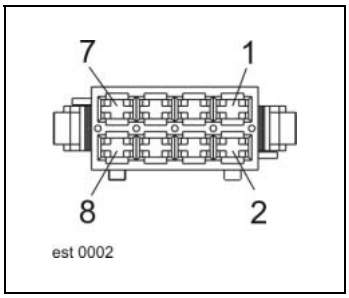
Connector A



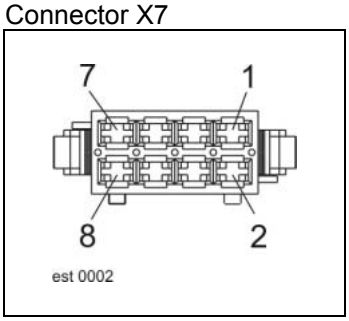
Connector B129



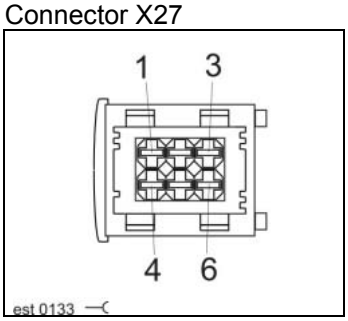
Connector MO



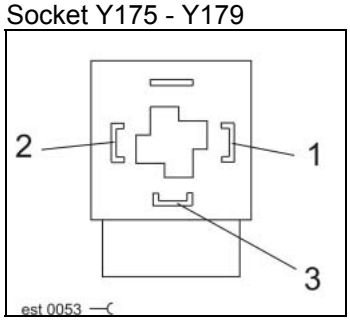
Connector X7



Connector X27



Socket Y175 - Y179



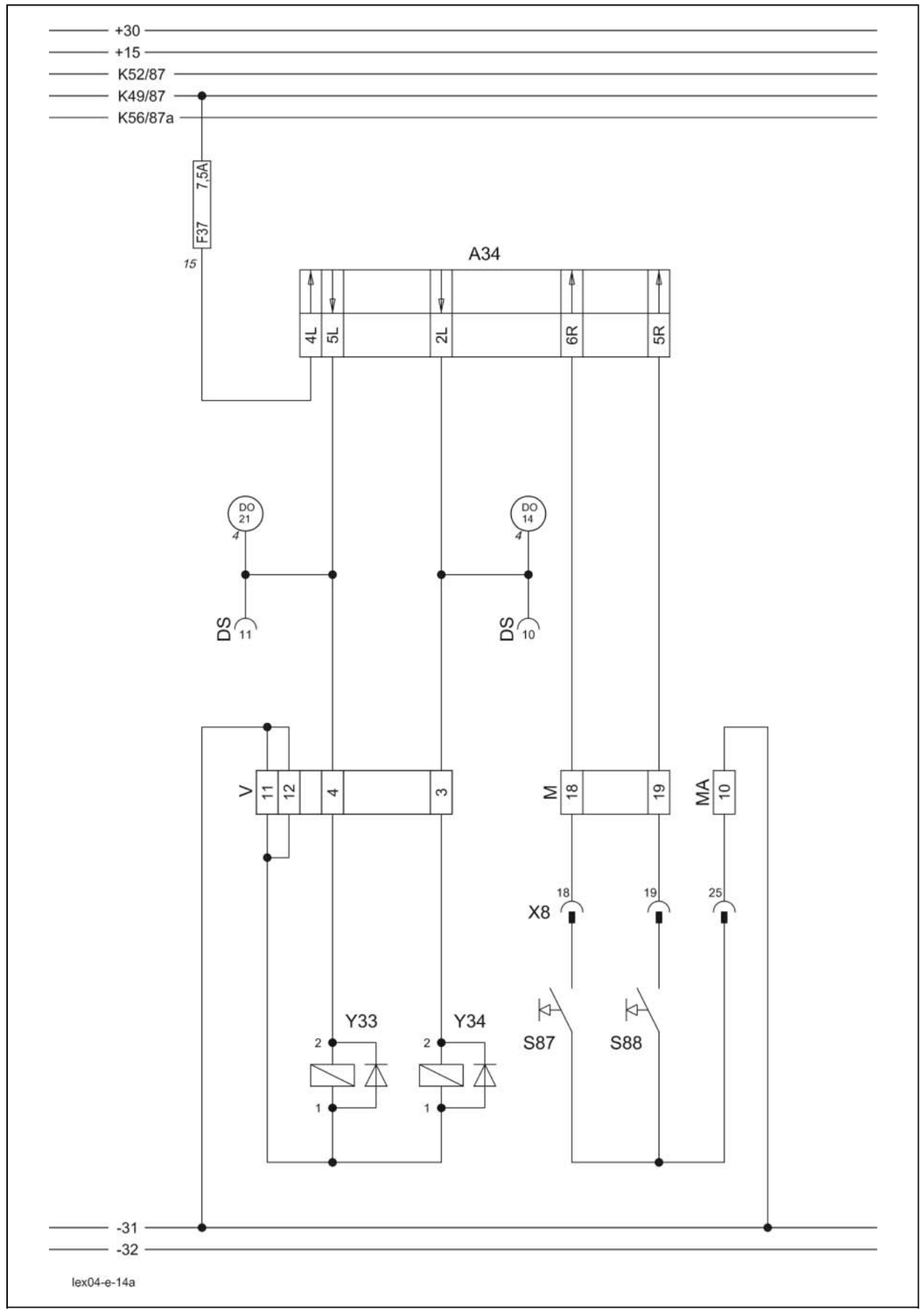
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 24	A10 38					0.35	wh-br
A 29	A10 31					0.35	gr-gn
A 30	A10 26					0.22	wh-bk
A 34	B 33	BB 12	A8 2	A16 2	Q 12		
	E 37	Bridge a	CB 2	Z 8		0.22	br-bk
BB-13						1.0	rd-gr
Mo-8	31 Earth					2.5	br
Mo-6						1.5	bk-vi
X7-4						1.0	rd-gr
X27-3						1.5	bk - vi
X27-5						1.0	br
X27-6						1.5	br
B129-1						0.75	br-gn
B129-2						0.75	rd-gr
B129-3						0.75	wh-vi
B129.1-1						0.75	br-bk
B129.1-2						0.75	rd-gr
B129.1-3						0.75	ye-bl
Y175-1						1.0	br
Y175-2						0.75	gn-wh
Y176-1						1.0	br
Y176-2						0.75	gn-rd
Y177-1						1.0	br
Y177-2						0.75	gn-bk
Y178-1						1.0	br
Y178-2						0.75	gn-br
Y179-1						1.0	br
Y179-2						0.75	gr

14a

Swinging the grain tank unloading tube

14a Swinging the grain tank unloading tube



Key to diagram:

Coordinates

A34	Grain tank module	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K49	Road travel main relay	4-i-20
S87	Swing out grain tank unloading tube switch	4-g-17
S88	Swing in grain tank unloading tube switch	4-g-17
X8	Ground speed control lever connector	4-g-17
Y33	Swing out grain tank unloading tube solenoid coil	5-m-20
Y34	Swing in grain tank unloading tube solenoid coil	5-m-20

Measured value table:

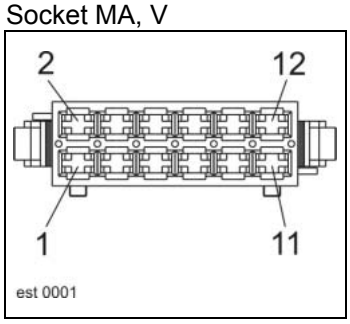
Item	Component	Measured value	Remark
Y33 Y34	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

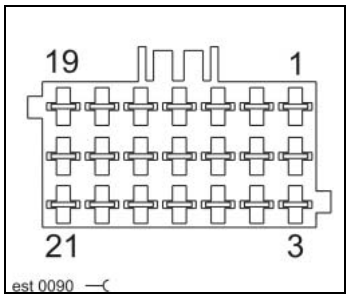
Swinging the grain tank unloading tube	The grain tank unloading tube swing function is controlled by the grain tank module A34. With the road travel circuit unlocked, the grain tank module A34 is supplied with power. Depending on the direction (swinging in or out), the switches (S87/S88) transmit an earth signal to the grain tank module A34. The grain tank module A34 actuates the corresponding grain tank unloading tube swing out solenoid coil Y33 or grain tank unloading tube swing in solenoid coil Y34. The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils (Y33/Y34) because this function requires that pressure is built up in the system.
Grain tank unloading tube swing time control	When one of the switches (S87 / S88) is actuated, the Swing unloading tube function remains active for 20 seconds. Actuating a switch (S87 / S88) briefly one more time stops the swing-in/swing-out movement of the unloading tube.
Grain tank unloading tube swung out warning	To display the unloading tube swung out warning, the Unloading tube swung out switch Z30 transmits an earth signal to terminal A30 (see also diagrams 5 and 15).

Connector pin definition:

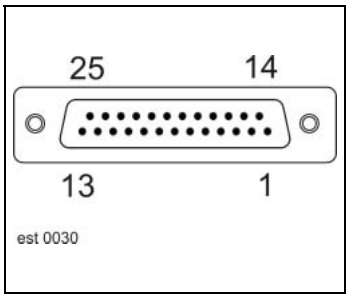
Socket MA, V



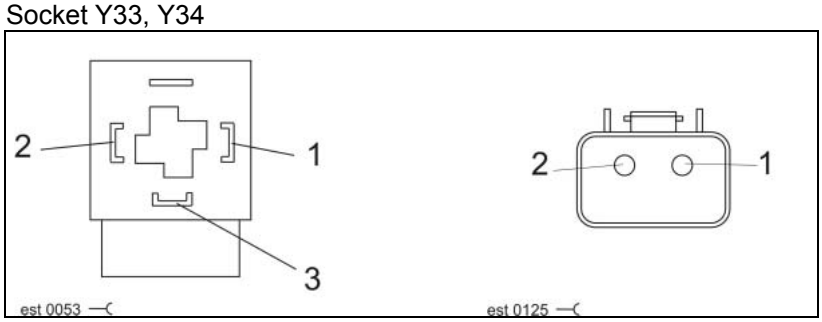
Socket M



Socket X8



Socket Y33, Y34



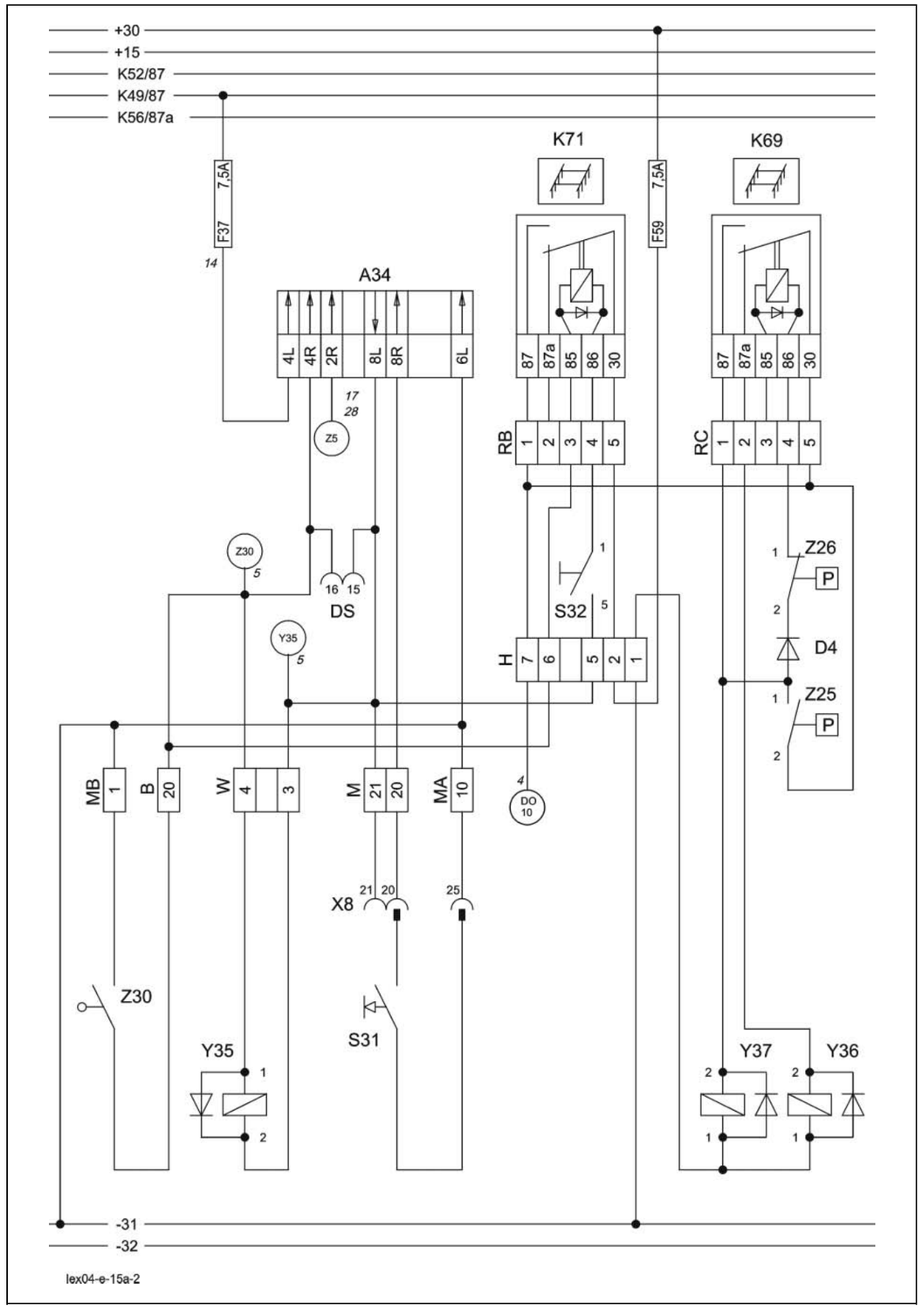
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MA10	31 Earth					1.5	br
M 18	A34 6R					0.5	gn-br
M 19	A34 5R					0.5	br-wh
V 3	A34 2L	DS 10	DO 14			1.5	wh-gn
V 4	A34 5L	DS 11	DO 21			1.5	wh-vi
V 11	31 Earth					2.5	br
V 12	31 Earth					2.5	br
X8-18						0.5	gn-br
X8-19						0.5	br-wh
X8-25						1.5	br

15a

Grain tank unloading /
Grain tank unloading aid

15a Grain tank unloading / Grain tank unloading aid



Key to diagram:

		Coordinates
A34	Grain tank module	2-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
S31	Grain tank unloading switch	4-g-17
S32	Grain tank unloading aid main switch	3-h-17
K49	Road travel main relay	4-i-20
K69	Grain tank unloading aid relay	3-i-20
K71	Grain tank unloading aid relay	3-i-20
Y35	Grain tank unloading solenoid coil	2-p-20
Y36	Grain tank unloading aid forward solenoid coil	4-n-20
Y37	Grain tank unloading aid backward solenoid coil	4-n-20
X8	Ground speed control lever connector	4-h-17
Z5	Seat contact actual value switch	4-h-18
Z25	Actual value switch (NO contact)	4-n-20
Z26	Actual value switch (NC contact)	4-n-20
Z30	Grain tank unloading tube swung out actual value switch	2-k-20

Measured value table:

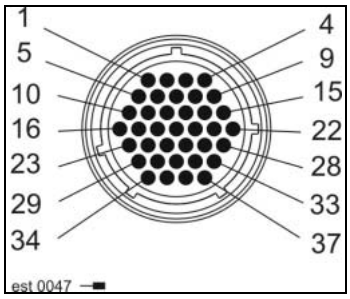
Item	Component	Measured value	Remark
Y35	Solenoid coil	0.75 A / 16 Ω	See inscription
Y36 Y37	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

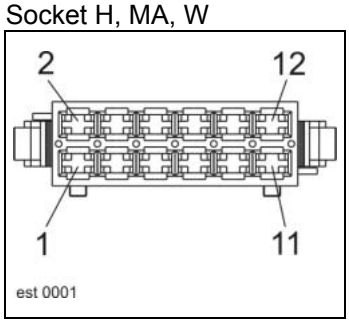
Grain tank unloading	The grain tank unloading function is controlled by the grain tank module A34. With the road travel circuit (S52) unlocked, the grain tank module (RIO) A34 is supplied with power. Further pre-conditions required for the grain tank unloading function include a closed seat contact (Z5) and a closed grain tank unloading tube swung out switch (Z30). When the grain tank unloading switch S31 transmits a signal to the grain tank module A34, the module energises the grain tank unloading solenoid coil (Y35). When the grain tank unloading switch S31 repeatedly transmits a signal to the grain tank module A34, the module de-energises the grain tank unloading solenoid coil (Y35).
Seat contact circuit	After leaving the operator's seat, all circuits depending on the seat contact (Z5) are interrupted after approx. 5 seconds.
Grain tank unloading aid	When grain tank unloading is active, the grain tank module A34 supplies the grain tank unloading aid switch (S32) and consequently relay K71 with power at pin 86. When relay K71 is energized, solenoid coil (Y36) is actuated via the connection from pin 30 to 87a in the unenergized relay K69. When the hydraulic cylinder reaches its end position, the oil pressure switch (Z25) will close for a short time. Relay K72 switches and the connection from pin 30 to 87 now actuates the solenoid coil (Y37). Diode (D4) now keeps relay K72 actuated until the hydraulic cylinder reaches the other end position and the oil pressure switch (Z26) cuts the electric circuit at pin 86. The master valve (Y77) is actuated via the diode PCB (Do) in parallel with one of the two solenoid coils (Y36/Y37) because these functions require that pressure is built up in the system.

Connector pin definition:

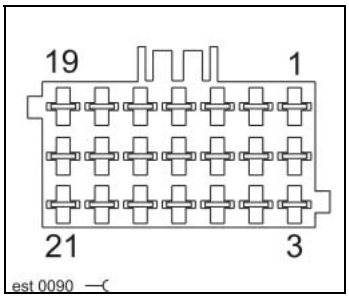
Connector B



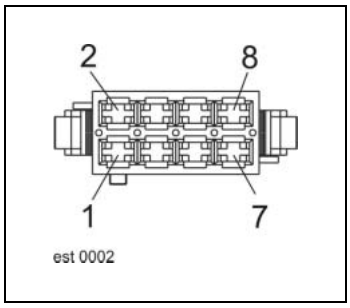
Socket H, MA, W



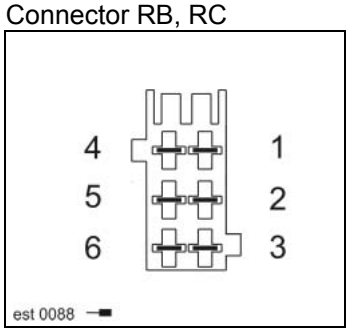
Socket M



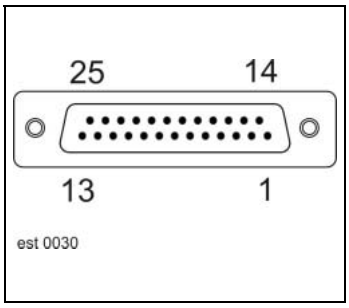
Socket MB



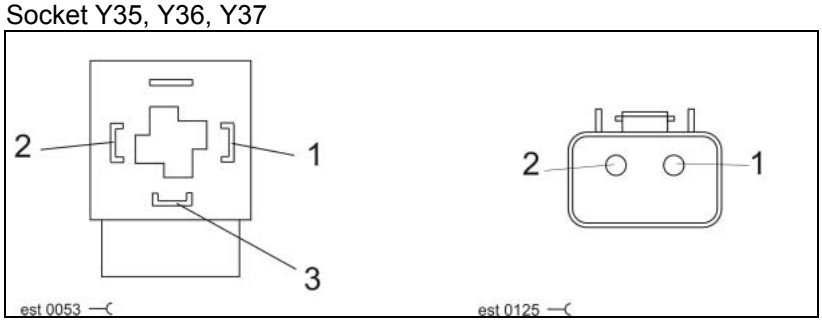
Connector RB, RC



Socket X8



Socket Y35, Y36, Y37



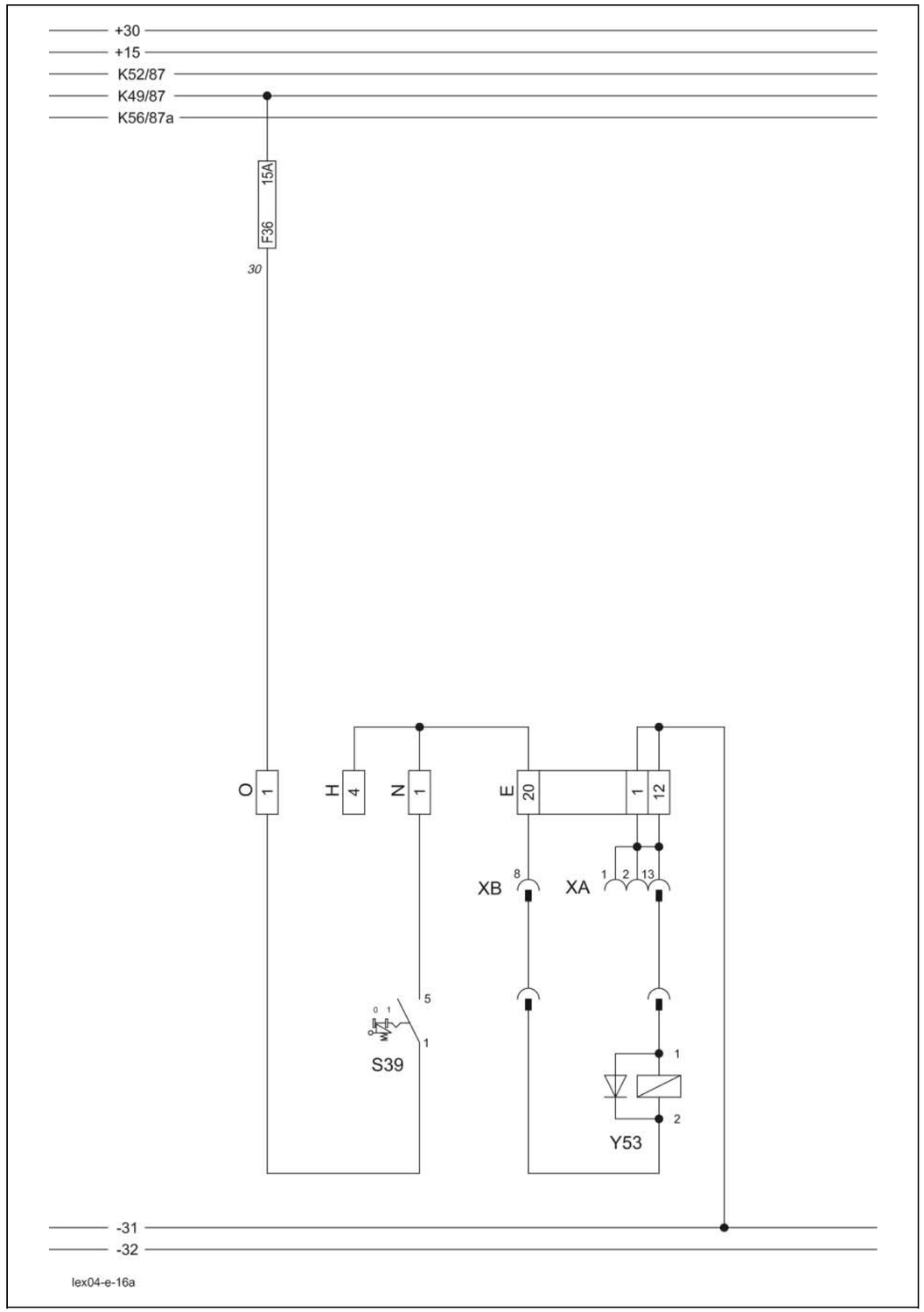
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 20	W 4	DS 16	H 6	A34 4R	A 5	1.0	gr-ye
H 1						1.5	br
H 2						1.5	rd
H 5	A 8	A34 8L	W 3	DS 15	M 21	1.0	wh-gr
H 6	A 5	B 20	W 4	DS 16	A34 4R	1.0	pi
H 7						1.5	ye-wh
M 20	A34 8R					0.5	br-vi
M 21	A 8	A34 8L	W 3	H 5	DS 15	0.5	br-rd
MA 10	-31					1.5	br
MB 1	-31					2.5	br
RB1						1.5	ye-wh
RB3						1.0	pi
RB4						1.0	bl-br
RB5						1.5	rd
RC1						1.5	wh-gn
RC2						1.5	wh-rd
RC3						1.0	br
RC4						1.0	ye-gn
RC5						1.5	ye-wh
X8-20						0.5	br-vi
X8-21						0.5	br-rd
X8-25						1.5	br
W 3	A 8	A34 8L	H 5	DS 15	M 21	1.0	bk-gr
W 4	A 5	B 20	DS 16	H 6	A34 4R	1.0	gr-vi
Y36-1						1.5	br
Y36-2						1.5	wh-rd
Y37-1						1.5	wh-gn
Y37-2						1.5	br
Z25-1						1.0	ye-gn
Z25-2						1.0	ye-wh
Z26-1						1.0	ye-gn
Z26-2						1.0	wh-bl

16a

Rape cutting knife circuit

16a Rape cutting knife circuit



Key to diagram:

Coordinates

S39	Rape knife drive switch, left-hand	3-h-17
K49	Road travel main relay	4-i-20
Y53	Left-hand rape knife circuit solenoid coil	7-c-26
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20

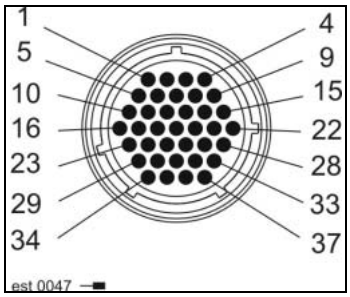
Measured value table:

Item	Component	Measured value	Remark
Y53	Solenoid coil	3.8 A 3.2 Ω	See inscription

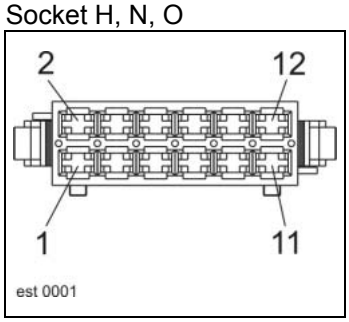
Description of function: None

Connector pin definition:

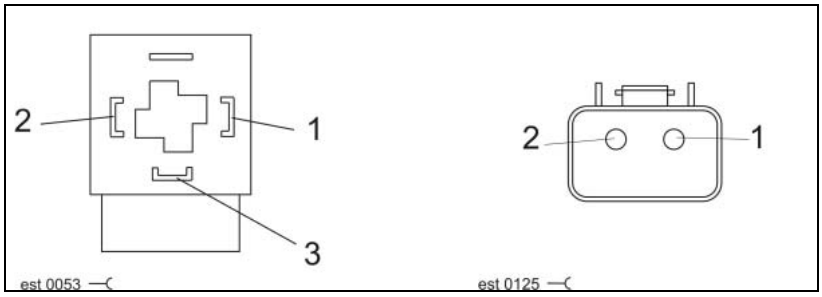
Connector E



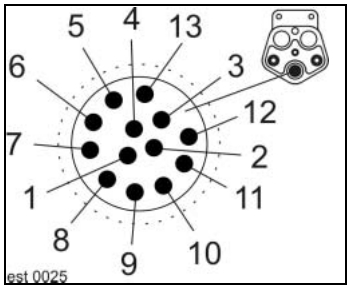
Socket H, N, O



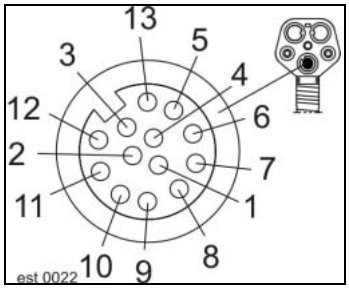
Socket Y35



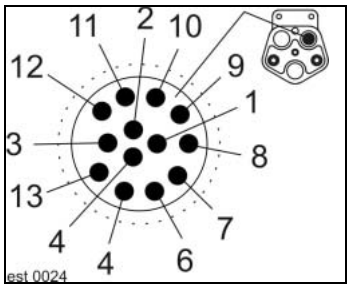
Connector XA



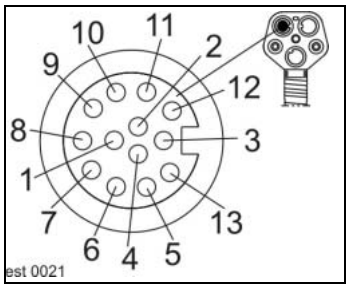
Socket XA



Connector XB



Socket XB



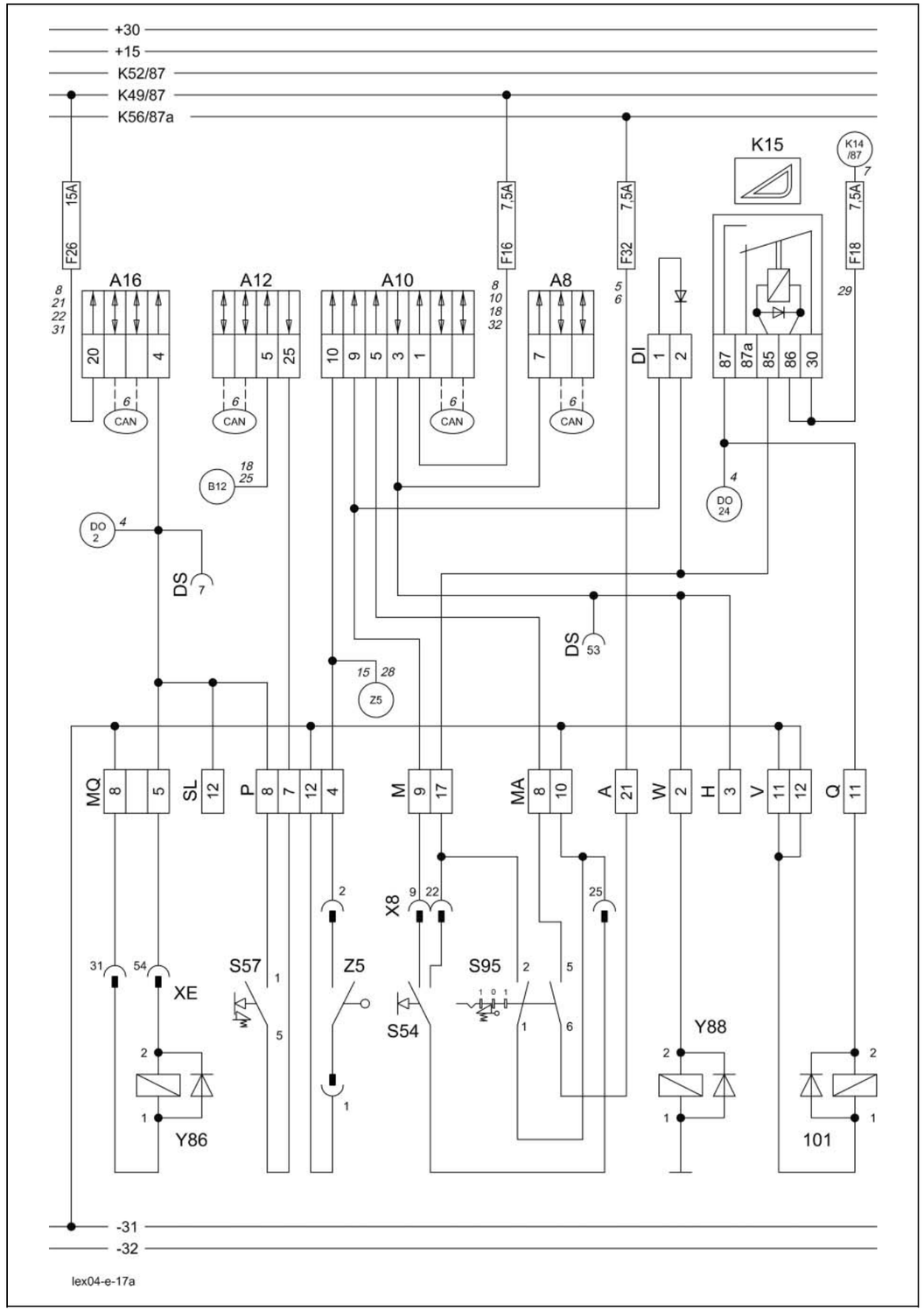
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 12	-31					1.5	br
E 20	N 1	H 4				1.5	vi
H 4	N 1	E 20					
N1	E 20	H 4				1.5	br-wh
O 1	F36 a					2.5	bk-bl
XA-1						1.5	br
XA-2						1.5	br
XA-13						1.5	br
XB-8						1.5	vi

17a

Front attachment drive, reverser drive, front attachment quick stop

17a Front attachment drive, reverser drive, front attachment quick stop



Key to diagram:

		Coordinates
A8	AUTOCONTOUR module (CAC)	2-i-20
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A16	Reel controller module (HAS)	2-i-20
B12	Feed rake conveyor speed sensor	6-h-20
DI	Warning device diode PCB	4-i-20
D0	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K15	Front attachment quick stop relay	4-i-20
K49	Road travel main relay	4-i-20
K56	Electronic unit plus relay	4-i-20
S54	Front attachment OFF switch	4-g-17
S95	Front attachment ON/OFF switch	3-h-17
S57	Front attachment reverse switch	3-h-17
XE	Feed rake conveyor connector	5-g-19
X8	Ground speed control lever connector	4-h-17
Y86	Reverse front attachment solenoid coil	7-f-16
Y88	Front attachment clutch solenoid coil	2-p.20
Y101	Front attachment quick stop solenoid coil	4-m-20
Z5	Seat contact actual value switch	4-h-18

Measured value table:

Item	Component	Measured value	Remark
K15	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y86 Y101	Solenoid coil	3.8 A 3.2 Ω	See inscription
Y88	Solenoid coil	1.2 A	12 V (PWM) See inscription

Description of function: 1/2

Front attachment circuit

Relay K49 must be actuated by the road travel circuit and the threshing mechanism must be actuated by relay K14 as pre-conditions for the front attachment drive. The threshing mechanism ON signal is read in by the fieldwork computer module (A10) – circuit diagram 7a.

Front attachment ON

Note: The front attachment circuit depends on the closed seat contact switch (Z5).

When actuating the front attachment ON/OFF switch S95, power is connected as a signal to the fieldwork computer module (A10). In order to ensure smooth start-up of the front attachment and to avoid strain on the drive components, the fieldwork computer module (A10) actuates the solenoid coil (Y88) in a modulated way (PWM) – Front attachment ON.

Note: When half throttle is set in the diesel engine speed adjustment (S35 – circuit diagram 2), the idle speed rpm value is used when the front attachment is ON.

Front attachment OFF

When actuating the STOP pushbutton (S54) on the multi-function handle to the first stage, earth is connected as a signal to the fieldwork computer module (A10). The fieldwork computer module (A10) cuts the power supply to the solenoid coil (Y88) – Front attachment OFF.

Front attachment quick stop

When actuating the STOP pushbutton (S54) on the multi-function handle to the second stage, the front attachment quick stop solenoid coil Y101 is actuated via relay K15 in addition to the "Front attachment OFF" function. The same applies to the actuation of the front attachment ON/OFF switch S95 in the operating panel. When S95 is actuated beyond the spring-centred centre position, the voltage signal to the fieldwork computer module (A10) is interrupted (front attachment OFF) and at the same time, K15 is actuated (quick stop ON).

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coil (Y101) because this function requires that pressure is built up in the system.

Description of function: 2/2

Reverse front attachment

The front attachment must not be engaged as a pre-condition for the reversing function. The speed monitor module (A12) connects voltage to the reverse switch (S57) as an additional safety feature only after the feed rake conveyor speed sensor (B12) stops transmitting a signal for approx. 2 seconds.
If these pre-conditions are met, voltage is connected from the speed monitor module (A12) to solenoid coil (Y86) via the reverse switch (S57) – Front attachment reverse function.
The master valve (Y77) is actuated via the diode PCB (DO) in parallel with the solenoid coil (Y86) because this function requires that pressure is built up in the system.

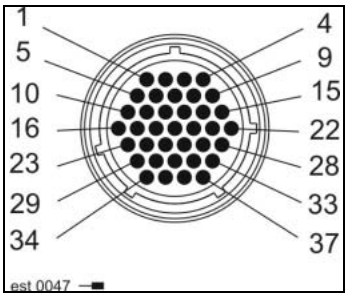
Important! When the reversing function is active, a signal is connected to the reel module (A16) which makes the reel drive variable displacement pump swing to maximum delivery, depending on the front attachment identification – circuit diagram 22.

Seat contact circuit

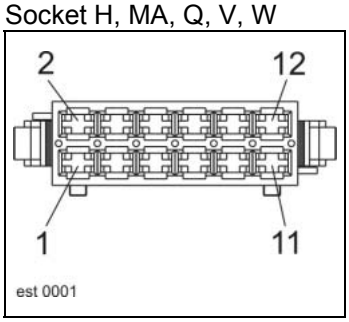
After leaving the operator's seat, all circuits depending on the seat contact are interrupted after approx. 5 seconds.

Connector pin definition:

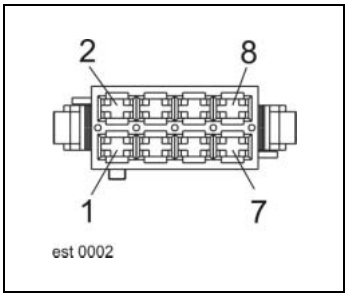
Connector A



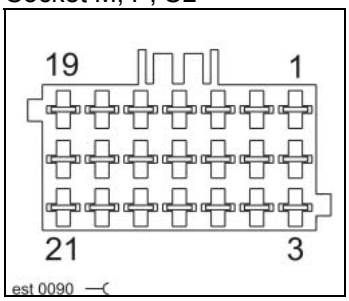
Socket H, MA, Q, V, W



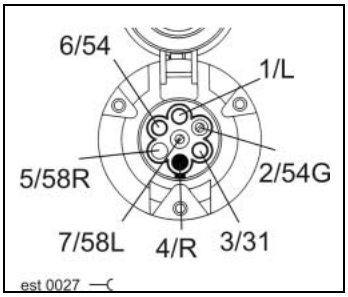
Socket MQ



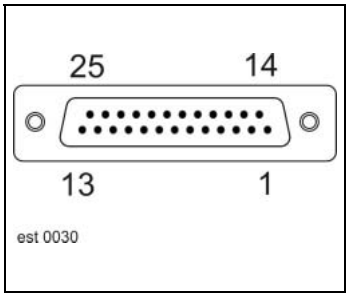
Socket M, P, SL



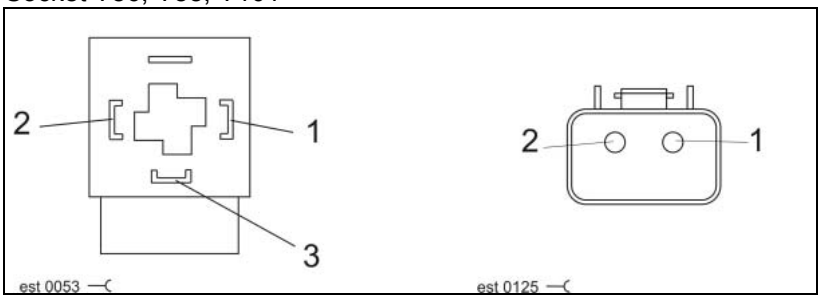
Socket XE



Socket X8



Socket Y86, Y88, Y101



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 21						1.0	bk
H 3	W 2	DS 53	A10 3	A8 7			
M 9	A10 9	DI 1				0.5	rd-ye
M 17	K15 85	DI 2				0.5	bl-rd
MA 8						0.5	bl-gr
MA 10						1.5	br
MQ 5	DO 2	DS 7	A16 4	SL 12	P 8	0.75	bk-bl
MQ 8	-31					2.5	br
P 4	A 20	A10 13	A12 16	A16 16	A8 16	0.5	bl-gn
	B 14	MO 4	E 30	MU 4	MV 4		
	MW 4	DS 63	A28 16	MR 4	SL 5		
	A25 16	A45 9					
P 7	A12 25					1.5	gr
P 8	MQ 5	DO 2	DS 7	A16 4	SL 12	1.5	gr
P 12	-31					2.5	br
Q 11	K15 87	DO 24				1.5	bk-wh
SL 12	P 8	MQ 5	DO 2	DS 7	A16 4		
V 11	-31					2.5	br
V 12	-31					2.5	br
W2	DS 53	H 3	A10 3	A8 7		1.0	ye-rd
X8-9						0.5	rd-ye
X8-22						0.5	bl-rd
X8-25						1.5	br
XE-31						2.5	br
XE-54						1.0	bk-bl

17s

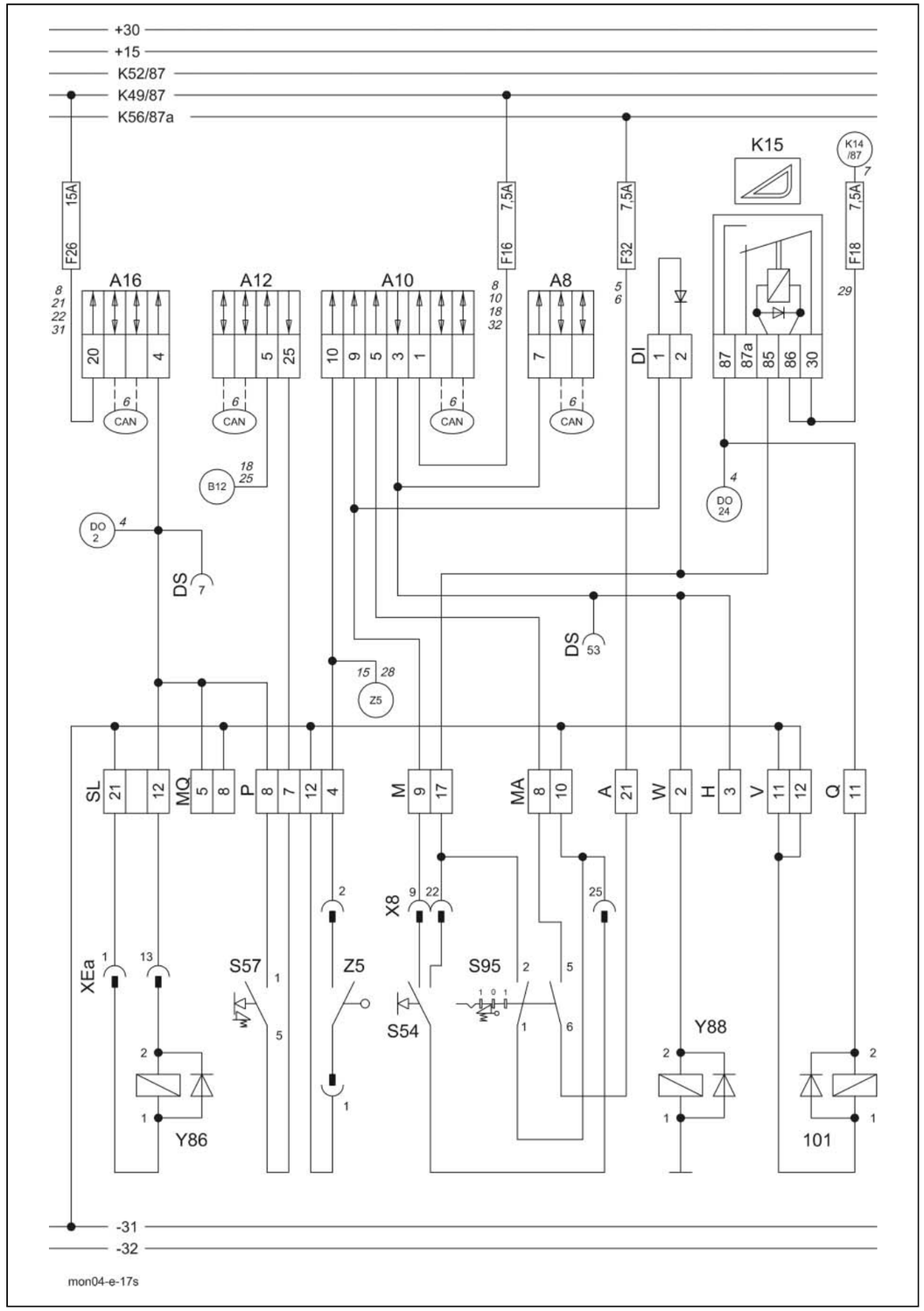
Front attachment drive, reverser drive, front attachment quick stop

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

17s Front attachment drive, reverser drive, front attachment quick stop, Montana 570-520
- with external MONTANA control unit (up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram:

Coordinates

A8	AUTOCONTOUR module (CAC)	2-i-20
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A16	Reel controller module (HAS)	2-i-20
B12	Feed rake conveyor speed sensor	6-h-20
DI	Warning device diode PCB	4-i-20
D0	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K15	Front attachment quick stop relay	4-i-20
K49	Road travel main relay	4-i-20
K56	Electronic unit plus relay	4-i-20
S54	Front attachment OFF switch	4-g-17
S95	Front attachment ON/OFF switch	3-h-17
S57	Front attachment reverse switch	3-h-17
XEa	Feeder housing connector	5-g-19
X8	Ground speed control lever connector	4-h-17
Y86	Reverse front attachment solenoid coil	7-f-16
Y88	Front attachment clutch solenoid coil	2-p-20
Y101	Front attachment quick stop solenoid coil	4-m-20
Z5	Seat contact actual value switch	4-h-18

Measured value table:

Item	Component	Measured value	Remark
K15	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y86 Y101	Solenoid coil	3.8 A 3.2 Ω	See lettering
Y88	Solenoid coil	1.2 A	12 V (PWM) See lettering

Description of function: 1/2

Front attachment circuit

Relay K49 must be actuated by the road travel circuit and the threshing mechanism must be actuated by relay K14 as pre-conditions for the front attachment drive. The threshing mechanism ON signal is read in by the fieldwork computer module (A10) – Circuit diagram 7a of standard machine.

Front attachment ON

Note: The front attachment circuit depends on the closed seat contact switch (Z5).

When actuating the front attachment ON/OFF switch (S95), a voltage is connected to the fieldwork computer module (A10) as a signal. In order to ensure smooth start-up of the front attachment and to avoid strain on the drive components, the fieldwork computer module (A10) actuates the solenoid coil (Y88) in a modulated way (PWM) – Front attachment ON.

Front attachment OFF

When actuating the STOP pushbutton (S54) on the multi-function handle to the first stage, earth is connected as a signal to the fieldwork computer module (A10). The fieldwork computer module (A10) cuts the power supply to the solenoid coil (Y88) – Front attachment OFF.

Front attachment quick stop

When actuating the STOP pushbutton (S54) on the multi-function handle to the second stage, the front attachment quick stop solenoid coil (Y101) is actuated via relay K15 in addition to the "Front attachment OFF" function.
The same applies to the actuation of the front attachment ON/OFF switch (S95) in the operating panel. When S95 is actuated beyond the spring-centred centre position, the voltage signal to the fieldwork computer module (A10) is interrupted (front attachment OFF) and at the same time, K15 is actuated (quick stop ON).

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coil (Y101) because this function requires that pressure is built up in the system.

Description of function: 2/2

Reverse front attachment

The front attachment must not be engaged as a pre-condition for the reversing function. The speed monitor module (A12) connects voltage to the reverse switch (S57) as an additional safety feature only after the feeder housing speed sensor (B12) stops transmitting a signal for approx. 2 seconds.
If these pre-conditions are met, voltage is connected from the speed monitor module (A12) to solenoid coil (Y86) via the reverse switch (S57) - Front attachment reverse function.
The master valve (Y77) is actuated via the diode PCB (DO) in parallel with the solenoid coil (Y86) because this function requires that pressure is built up in the system.

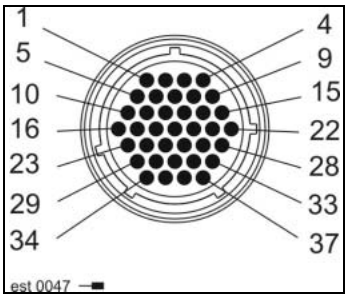
Important! When reversing is activated, a signal is connected to the reel controller module (A16) which makes the reel drive variable-displacement pump swing to maximum delivery, depending on the front attachment identification – Circuit diagram 22 of standard machine.

Seat contact circuit

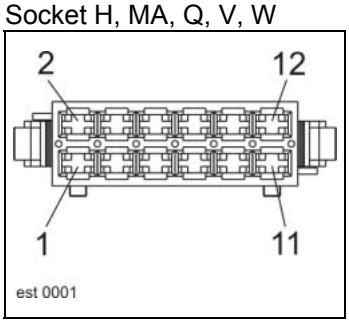
After leaving the operator's seat, all circuits depending on the seat contact are interrupted after approx. 5 seconds.

Connector pin definition:

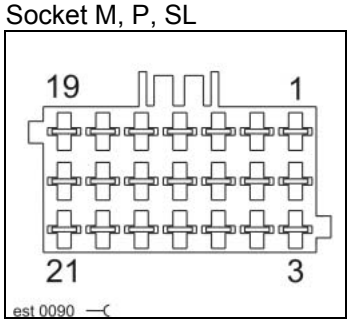
Connector A



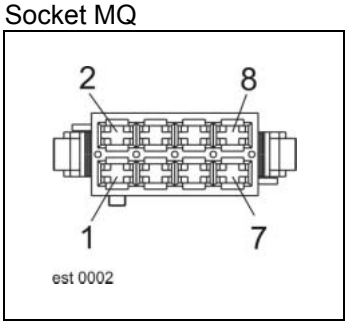
Socket H, MA, Q, V, W



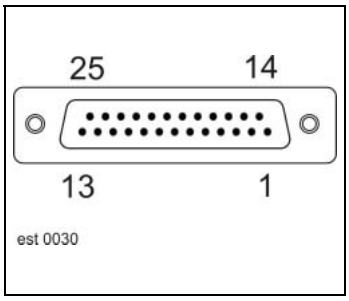
Socket M, P, SL



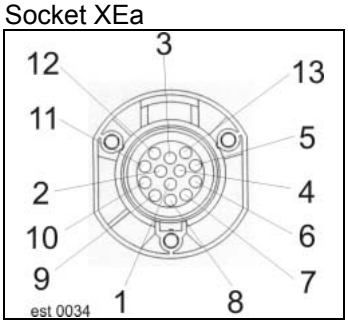
Socket MQ



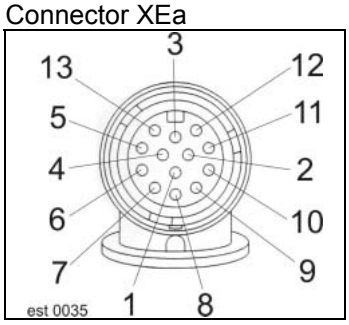
Socket X8



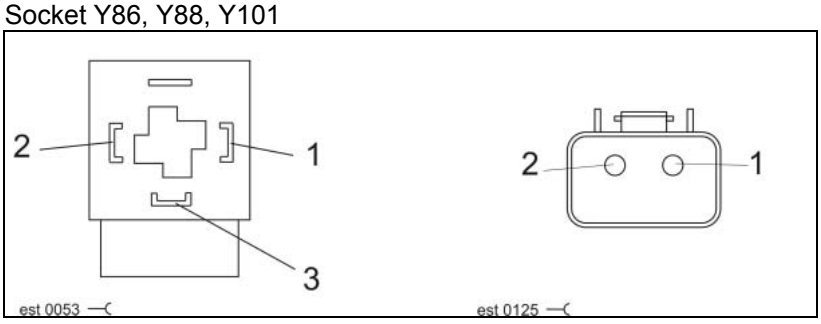
Socket XEa



Connector XEa



Socket Y86, Y88, Y101



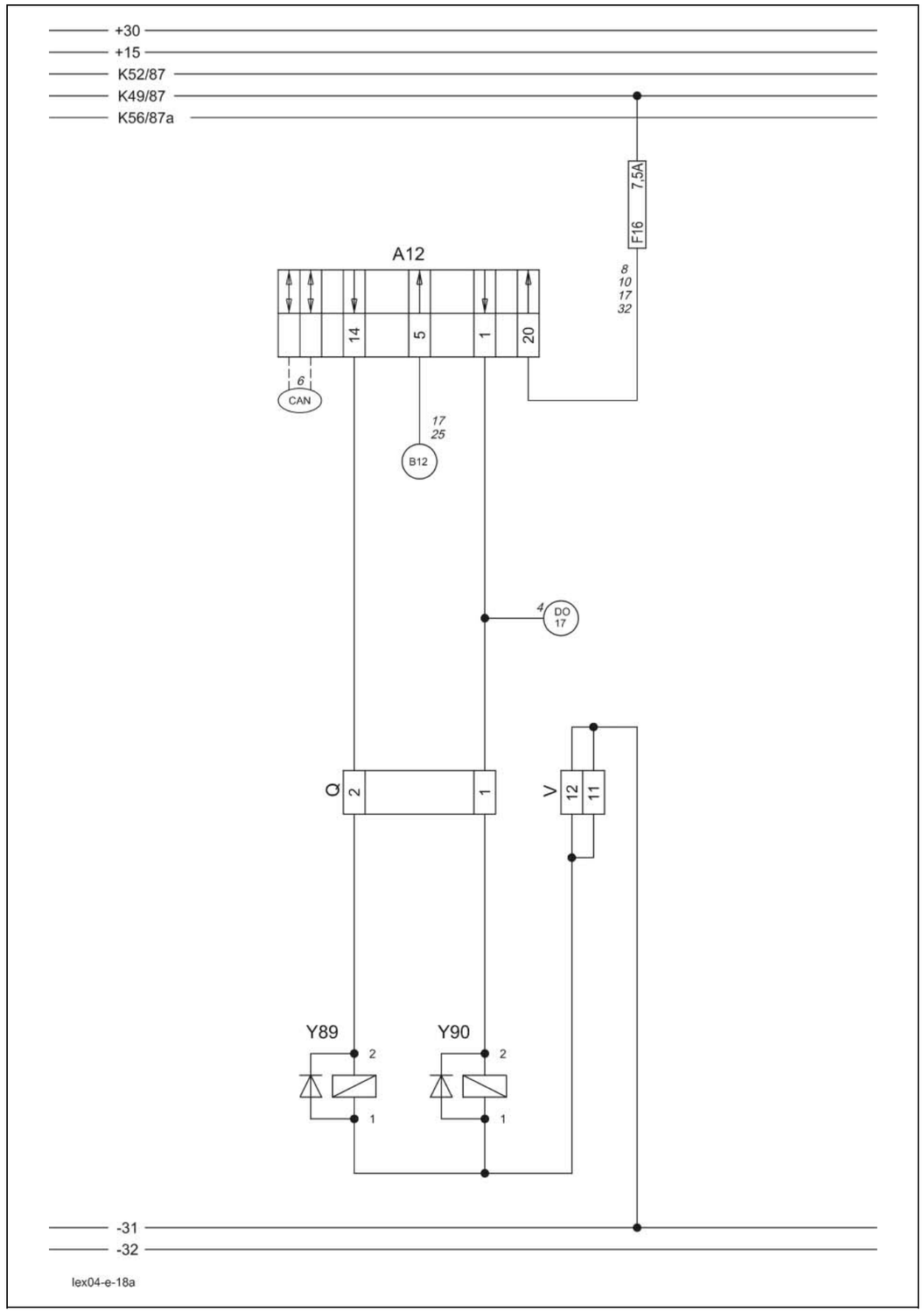
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 21						1.0	bk
H 3	W 2	DS 53	A10 3	A8 7			
M 9	A10 9	DI 1				0.5	rd-ye
M 17	K15 85	DI 2				0.5	bl-rd
MA 8						0.5	bl-gr
MA 10						1.5	br
MQ 5	DO 2	DS 7	A16 4	SL 12	P 8		
MQ 8	-31						
P 4	A 20	A10 13	A12 16	A16 16	A8 16	0.5	bl-gn
	B 14	MO 4	E 30	MU 4	MV 4		
	MW 4	DS 63	A28 16	MR 4	SL 5		
	A25 16	A45 9					
P 7	A12 25					1.5	gr
P 8	MQ 5	DO 2	DS 7	A16 4	SL 12	1.5	gr
P 12	-31					2.5	br
Q 11	K15 87	DO 24				1.5	bk-wh
SL 12	P 8	MQ 5	DO 2	DS 7	A16 4	1.0	gn
SL 21						2.5	br
V 11	-31					2.5	br
V 12	-31					2.5	br
W2	DS 53	H 3	A10 3	A8 7		1.0	ye-rd
X8-9						0.5	rd-ye
X8-22						0.5	bl-rd
X8-25						1.5	br
XE-31						2.5	br
XE-54						1.0	bk-bl

18a

Front attachment variable-speed drive

18a Front attachment variable-speed drive



Key to diagram:

		Coordinates
A12	Speed monitor module (DZW)	2-i-20
B12	Feed rake conveyor speed sensor	6-h-16
DO	Master valve diode PCB	4-i-20
K49	Road travel main relay	4-i-20
Y89	Front attachment variable-speed drive slow solenoid coil	4-m-20
Y90	Front attachment variable-speed drive fast solenoid coil	4-m-20

Measured value table:

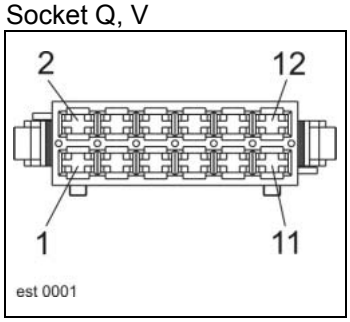
Item	Component	Measured value	Remark
Y89 Y90	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

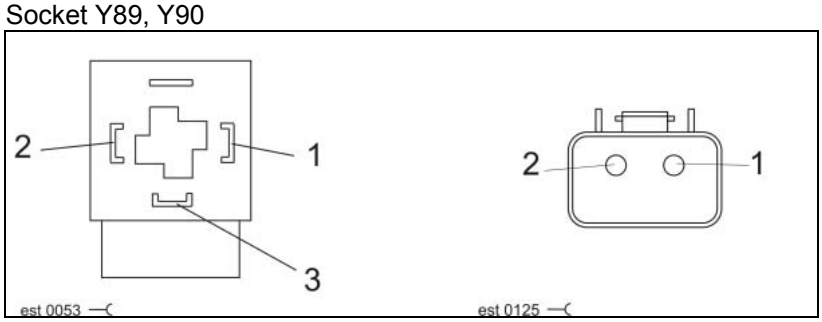
Front attachment variable-speed drive	When the threshing mechanism is engaged, a CAN bus signal is transmitted to the speed monitor module (DZW) A12 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the threshing drum position. The speed monitor module A12 controls the corresponding solenoid coils (Y89/Y90). The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the front attachment variable-speed drive fast solenoid coil (Y90) because this function requires that pressure is built up in the system.
Front attachment speed display	The speed monitor module (A12) converts the analogue signal from the feed rake conveyor speed sensor (B12) into a digital signal which is displayed on terminal (A30) via the CAN bus.

Connector pin definition:

Socket Q, V



Socket Y89, Y90



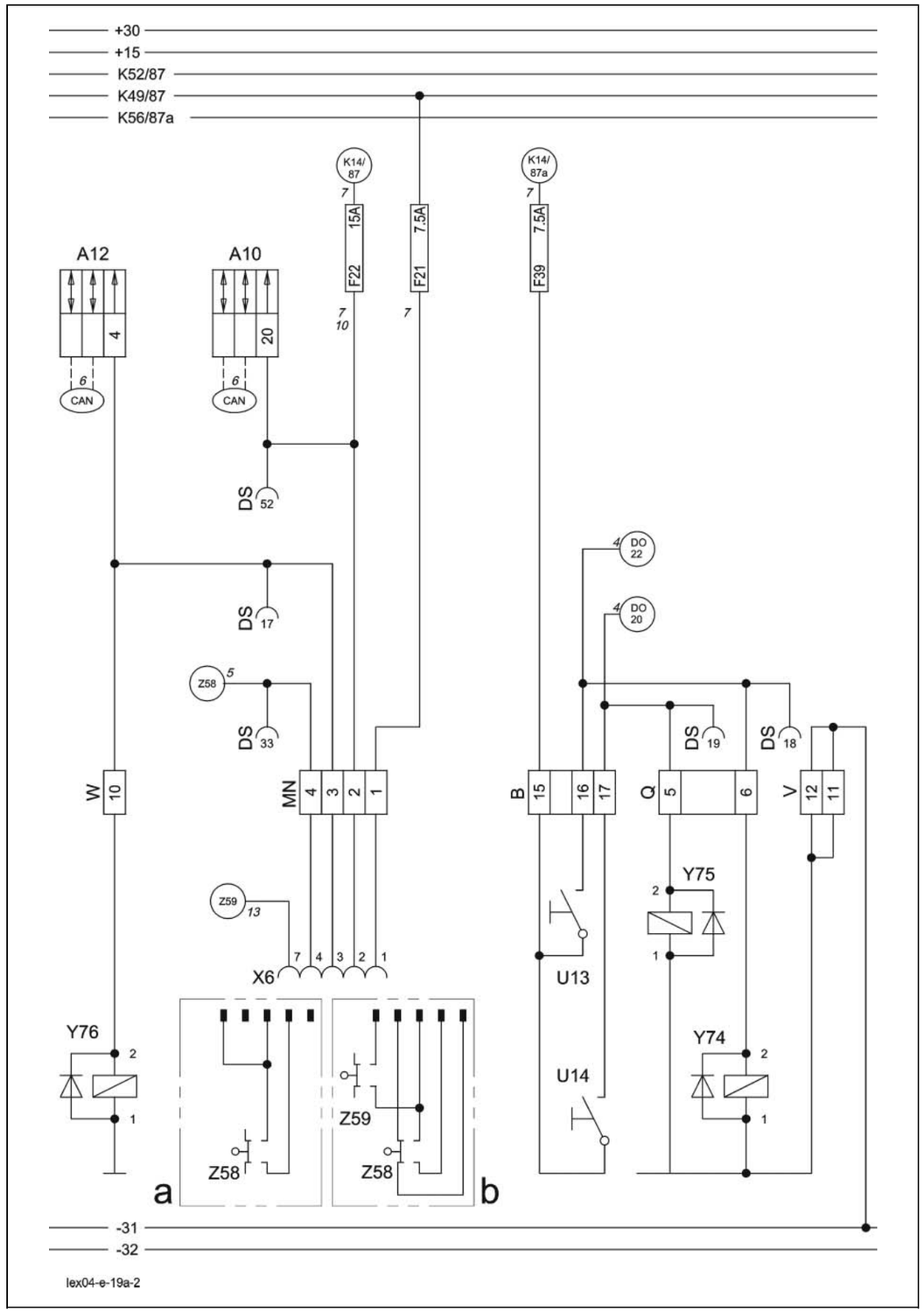
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
Q 1	A12 1	DO 17				1.5	ye-gr
Q 2	A12 14					1.5	ye-gn
V 11	-31					2.5	br
V 12	-31					2.5	br

19a

Straw chopper

19a Straw chopper



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
U13	Straw chopper in working position switch	5-r-20
U14	Straw chopper in swathing mode switch	5-r-20
X6	Straw chopper connector	5-s-16
Y74	Straw chopper in working position / swathing flap closed solenoid coil	5-m-20
Y75	Straw chopper in swathing mode / swathing flap open solenoid coil	5-m-20
Y76	Straw chopper clutch solenoid coil	2-p.20
Z58	Straw chopper working position actual value switch	5-s-20
Z59	Uni-spreader / baffle plate position actual value switch	5-s-16

a- Standard chopper
b- when uni-spreader is fitted

Measured value table:

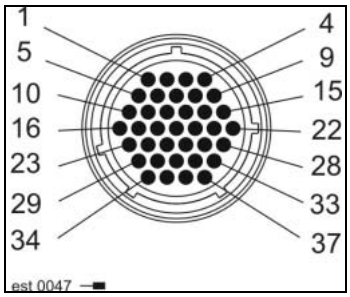
Item	Component	Measured value	Remark
Y74 Y75 Y76	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

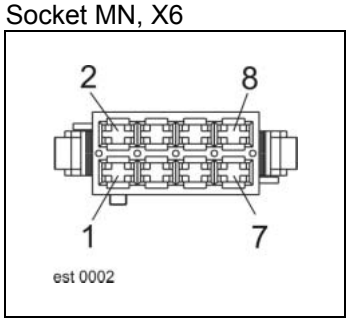
Swathing flap	With the road travel circuit unlocked and only when the threshing mechanism is disengaged, the switches (U13/U14) for adjusting the swathing flap and consequently the corresponding solenoid coil (Y74 and/or Y75) are supplied with power. The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils (Y74/Y75) because this function requires that pressure is built up in the system.
Straw chopper circuit	The relay K49 must be actuated by unlocking the road travel switch (S52) and the limit switch (Z58) must be closed in working position as pre-conditions for the straw chopper drive. The threshing mechanism clutch switch (S25) controls relay K14 and thus activates the power supply for solenoid coil (Y21) of the threshing mechanism clutch (see also diagram 4). When the limit switch (Z58) is closed, the solenoid coil (Y76) for the straw chopper drive is also actuated in the working position of the straw chopper.
Straw chopper speed monitoring	When the straw chopper is activated, the speed monitor module (A12) receives the start signal for monitoring the straw chopper speed from sensor (B28).

Connector pin definition:

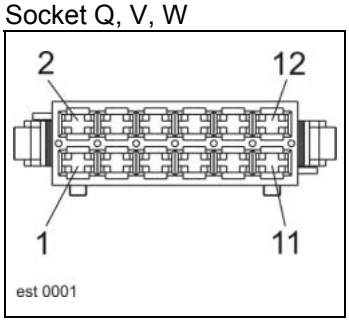
Connector B



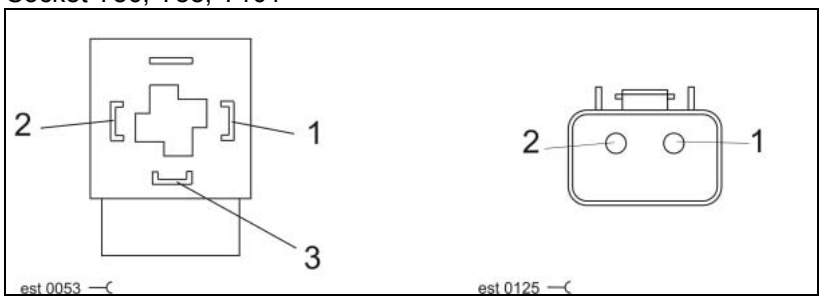
Socket MN, X6



Socket Q, V, W



Socket Y86, Y88, Y101



Interconnection list:

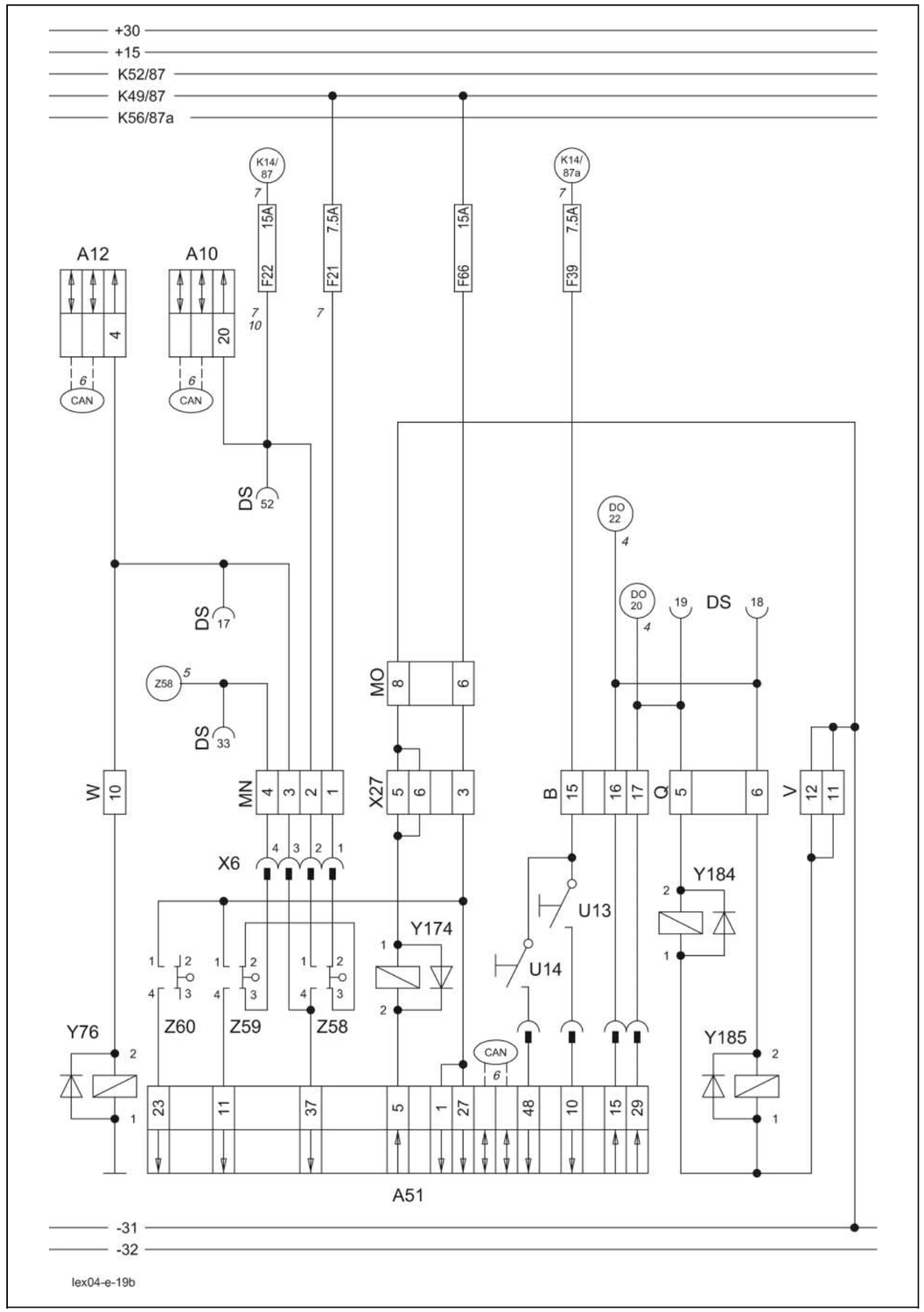
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 15	F39 a					1.5	bl
B 16	Q 6	DO 22	DS 18			1.5	wh-or
B 17	Q 5	DO 20	DS 19			1.5	or-ye
MN 1	F21 a	K14 86				1.5	bk-vi
MN 2	W 1	F22 a	K63 86	A10 20	DS 52	2.5	rd-ye
MN 3	W 10	A12 4	DS 17			2.5	rd-bl
MN 4	A 4	DS 33				1.5	gn-ye
Q 5	B 17	DO 20	DS 19			1.5	bk-gn
Q 6	B 16	DO 22	DS 18			1.5	bk-br
V 11	-31					2.5	br
V 12	-31					2.5	br
W 10	MN 3	A12 4	DS 17			1.0	rd-bl
X6-1						1.5	bk-vi
X6-2						2.5	rd-ye
X6-3						2.5	rd-bl
X6-4						1.5	gn-ye

19b

Straw chopper

Radial spreader without chaff spreader

19b Straw chopper, radial spreader without chaff spreader



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A51	Radial spreader module	5-s-18
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
U13	Straw chopper in working position switch (Radial spreader in working or swathing position)	5-r-20
U14	Straw chopper in rest position switch (Radial spreader in transport position)	5-r-20
X6	Straw chopper connector	5-s-16
Y76	Straw chopper clutch solenoid coil	2-p-20
Y174	Radial spreader transport position solenoid coil	5-t-20
Y184	Radial spreader swathing position solenoid coil	5-m-20
Y185	Radial spreader working/transport position solenoid coil	5-m-20
Z58	Straw chopper/uni-spreader actual value switch (Radial spreader chopping position)	5-t-16
Z59	Uni-spreader/deflector position actual value switch (Radial spreader swathing position)	5-s-16
Z60	Straw chopper in transport position actual value switch (Radial spreader transport position)	5-u-16

Measured value table:

Item	Component	Measured value	Remark
Y174 Y184 Y185	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function: 1/2

Radial spreader in working or swathing position

With the road travel circuit unlocked and only with the threshing mechanism disengaged, switch (U13) is supplied with power.
The position control of the radial spreader requires that another pre-condition is fulfilled: No signal from the straw chopper speed sensor B28 (uni-spreader) is identified on the CAN bus for at least 2 seconds.
When the radial spreader is in transport position, it moves to the swathing position first after switch U13 is actuated. To achieve this, the radial spreader module (A51) actuates solenoid coil Y184 until it reaches its end position - actual value switch Z59 is closed on pins 1 and 4.

If switch U13 is actuated one more time after the swathing position is identified - actual value switch Z59 is closed on pins 1 and 4 - the radial spreader module (A51) actuates the solenoid coil Y185 until the working position is identified - actual value switch Z58 is closed on pins 1 and 4.

When switch U13 is pressed repeatedly, the radial spreader again changes between working and swathing position - toggle function.

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils (Y184/Y185) because this function requires that pressure is built up in the system.

Radial spreader in transport position

With the road travel circuit unlocked and only with the threshing mechanism disengaged, switch (U14) is supplied with power.
The position control of the radial spreader requires that another pre-condition is fulfilled: No signal from the straw chopper speed sensor B28 (uni-spreader) is identified on the CAN bus for at least 2 seconds.

When the straw chopper switch is actuated while in rest position (U14 = radial spreader in transport position), the radial spreader moves to transport position.
To achieve this, the radial spreader module actuates the solenoid coils Y185 and Y174. The actual value switches Z58 and Z59 are not actuated any more (closed on pins 2 and 3).

When the correct transport position is reached, the actual value switch Z60 is actuated (closed on pin 1 and 4).

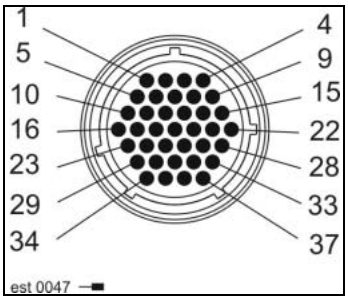
The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coil (Y185) because this function requires that pressure is built up in the system.

Description of function: 2/2

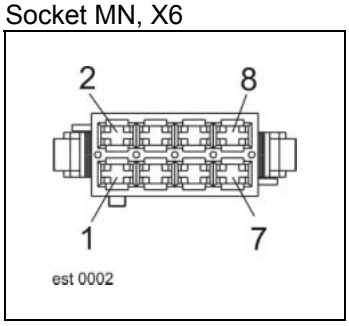
Straw chopper / radial spreader warning	When the actual value switches Z58 and Z59 are not actuated, the terminal A30 gives a warning when the threshing mechanism is engaged.
Straw chopper circuit	The relay K49 must be actuated by unlocking the road travel switch (S52) and the limit switch (Z58) must be closed in working position as pre-conditions for the straw chopper drive. The threshing mechanism clutch switch (S25) controls relay K14 and thus activates the power supply for solenoid coil (Y21) of the threshing mechanism clutch (see also diagram 4). When the actual value switch (Z58) is actuated, the solenoid coil (Y76) for the straw chopper drive is also actuated in the working position of the straw chopper.
Straw chopper speed monitoring	When the straw chopper is activated, the speed monitor module (A12) receives the start signal for monitoring the straw chopper speed from sensor (B28).

Connector pin definition:

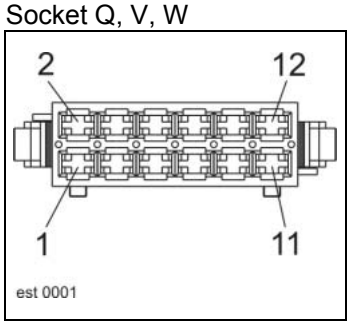
Connector B



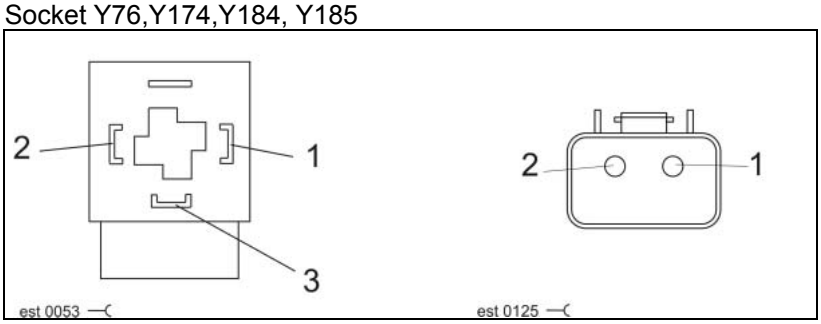
Socket MN, X6



Socket Q, V, W



Socket Y76,Y174,Y184, Y185



Interconnection list: 1/2

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 15	F39 a					1.5	bl
B 16	Q 6	DO 22	DS 18			1.5	wh-or
B 17	Q 5	DO 20	DS 19			1.5	or-ye
MN 1	F21 a	K14 86				1.5	bk-vi
MN 2	W 1	F22 a	K63 86	A10 20	DS 52	2.5	rd-ye
MN 3	W 10	A12 4	DS 17			2.5	rd-bl
MN 4	A 4	DS 33				1.5	gn-ye
Q 5	B 17	DO 20	DS 19			1.5	bk-gn
Q 6	B 16	DO 22	DS 18			1.5	bk-br
V 11	-31					2.5	br
V 12	-31					2.5	br
W 10	MN 3	A12 4	DS 17			1.0	rd-bl
X6-1						1.5	bk-vi
X6-2						2.5	rd-ye
X6-3						2.5	rd-bl
X6-4						1.5	gn-ye

Interconnection list: 2/2

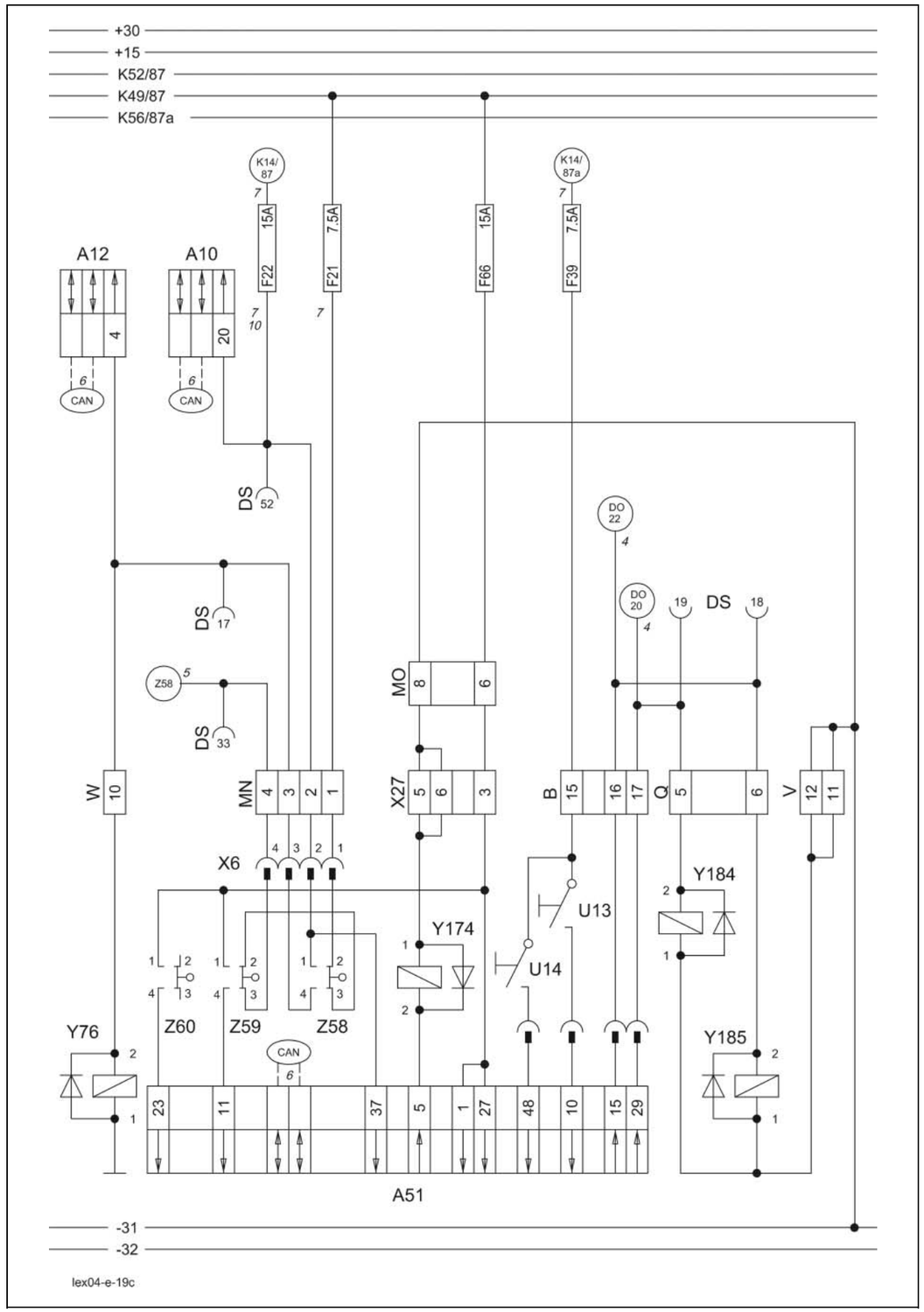
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X27-3						1.5	bk-vi
X27-5						1.0	br
X27-6						1.5	br
Y174-1						1.0	br
Y174.2						0.75	gn
A51 1						1.5	bk/vi
A51 5						0.75	gn
A51 10						0.75	wh
A51 11						0.75	vi-ye
A51 15						1.0	wh-or
A51 23						0.75	vi-bl
A51 27						1.5	bk-vi
A51 29						1.0	ye-or
A51 37						0.75	rd-bl
A51 48						0.75	or-wh
Z58-3						0.75	ye-vi
Z59-1						0.75	bk-vi

19c

Straw chopper

Radial spreader with chaff spreader

19c Straw chopper, radial spreader with chaff spreader



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A51	Radial spreader module	5-s-18
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
U13	Straw chopper in working position switch (Radial spreader in working or swathing position)	5-r-20
U14	Straw chopper in rest position switch (Radial spreader in transport position)	5-r-20
X6	Straw chopper connector	5-s-16
Y76	Straw chopper clutch solenoid coil	2-p-20
Y174	Radial spreader transport position solenoid coil	5-t-20
Y184	Radial spreader swathing position solenoid coil	5-m-20
Y185	Radial spreader working/transport position solenoid coil	5-m-20
Z58	Straw chopper/uni-spreader actual value switch (Radial spreader chopping position)	5-t-16
Z59	Uni-spreader/deflector position actual value switch (Radial spreader swathing position)	5-s-16
Z60	Straw chopper in transport position actual value switch (Radial spreader transport position)	5-u-16

Measured value table:

Item	Component	Measured value	Remark
Y174 Y184 Y185	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function: 1/2

Radial spreader in working or swathing position

With the road travel circuit unlocked and only with the threshing mechanism disengaged, switch (U13) is supplied with power.
The position control of the radial spreader requires that another pre-condition is fulfilled: No signal from the straw chopper speed sensor B28 (uni-spreader) is identified on the CAN bus for at least 2 seconds.
When the radial spreader is in transport position, it moves to the swathing position first after switch U13 is actuated. To achieve this, the radial spreader module (A51) actuates solenoid coil Y184 until it reaches its end position - actual value switch Z59 is closed on pins 1 and 4.

If switch U13 is actuated one more time after the swathing position is identified - actual value switch Z59 is closed on pins 1 and 4 - the radial spreader module (A51) actuates the solenoid coil Y185 until the working position is identified - actual value switch Z58 is closed on pins 1 and 4.

When switch U13 is pressed repeatedly, the radial spreader again changes between working and swathing position - toggle function.

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils (Y184/Y185) because this function requires that pressure is built up in the system.

Radial spreader in transport position

With the road travel circuit unlocked and only with the threshing mechanism disengaged, switch (U14) is supplied with power.
The position control of the radial spreader requires that another pre-condition is fulfilled: No signal from the straw chopper speed sensor B28 (uni-spreader) is identified on the CAN bus for at least 2 seconds.

When the straw chopper switch is actuated while in rest position (U14 = radial spreader in transport position), the radial spreader moves to transport position.
To achieve this, the radial spreader module actuates the solenoid coils Y185 and Y174. The actual value switches Z58 and Z59 are not actuated any more (closed on pins 2 and 3).

When the correct transport position is reached, the actual value switch Z60 is actuated (closed on pin 1 and 4).

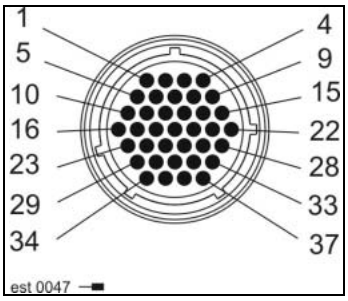
The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coil (Y185) because this function requires that pressure is built up in the system.

Description of function: 2/2

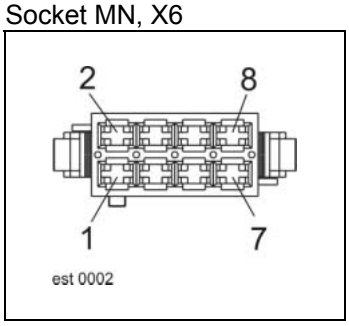
Straw chopper / radial spreader warning	When the actual value switches Z58 and Z59 are not actuated, the terminal A30 gives a warning when the threshing mechanism is engaged.
Straw chopper circuit	The relay K49 must be actuated by unlocking the road travel switch (S52) and the limit switch (Z58) must be closed in working position as pre-conditions for the straw chopper drive. The threshing mechanism clutch switch (S25) controls relay K14 and thus activates the power supply for solenoid coil (Y21) of the threshing mechanism clutch (see also diagram 4). When the actual value switch (Z58) is actuated, the solenoid coil (Y76) for the straw chopper drive is also actuated in the working position of the straw chopper.
Straw chopper speed monitoring	When the straw chopper is activated, the speed monitor module (A12) receives the start signal for monitoring the straw chopper speed from sensor (B28).

Connector pin definition:

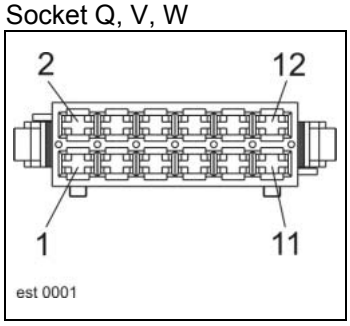
Connector B



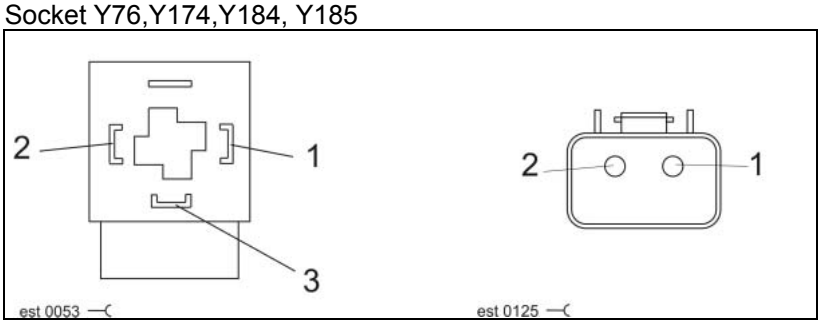
Socket MN, X6



Socket Q, V, W



Socket Y76,Y174,Y184, Y185



Interconnection list: 1/2

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 15	F39 a					1.5	bl
B 16	Q 6	DO 22	DS 18			1.5	wh-or
B 17	Q 5	DO 20	DS 19			1.5	or-ye
MN 1	F21 a	K14 86				1.5	bk-vi
MN 2	W 1	F22 a	K63 86	A10 20	DS 52	2.5	rd-ye
MN 3	W 10	A12 4	DS 17			2.5	rd-bl
MN 4	A 4	DS 33				1.5	gn-ye
Q 5	B 17	DO 20	DS 19			1.5	bk-gn
Q 6	B 16	DO 22	DS 18			1.5	bk-br
V 11	-31					2.5	br
V 12	-31					2.5	br
W 10	MN 3	A12 4	DS 17			1.0	rd-bl
X6-1						1.5	bk-vi
X6-2						2.5	rd-ye
X6-3						2.5	rd-bl
X6-4						1.5	gn-ye

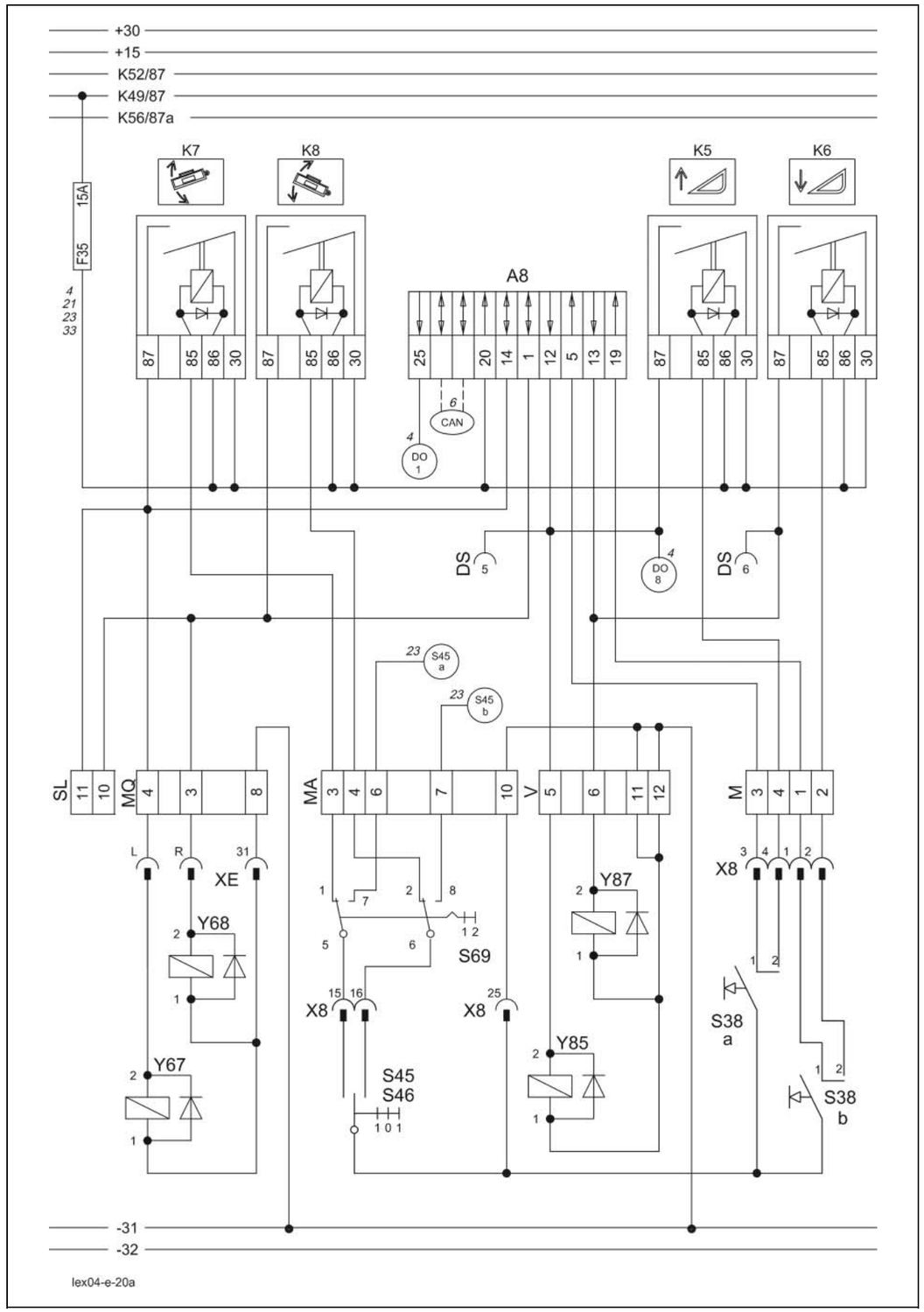
Interconnection list: 2/2

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X27-3						1.5	bk-vi
X27-5						1.0	br
X27-6						1.5	br
Y174-1						1.0	br
Y174.2						0.75	gn
A51 1						1.5	bk/vi
A51 5						0.75	gn
A51 10						0.75	wh
A51 11						0.75	vi-ye
A51 15						1.0	wh-or
A51 23						0.75	vi-bl
A51 27						1.5	bk-vi
A51 29						1.0	ye-or
A51 37						0.75	rd-bl
A51 48						0.75	or-wh
Z58-3						0.75	ye-vi
Z59-1						0.75	bk-vi

20a

Front attachment raise/lower, cross levelling

20a Front attachment raise/lower, cross levelling



Key to diagram:

		Coordinates
A8	AUTOCONTOUR module (CAC)	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K5	Front attachment raise relay	4-i-20
K6	Front attachment lower relay	4-i-20
K7	Left-hand cutterbar cross levelling relay	4-i-20
K8	Right-hand cutterbar cross levelling relay	4-i-20
K49	Road travel main relay	4-i-20
S38a	Front attachment raise multifunction pushbutton switch	4-g-17
S38b	Front attachment lower multifunction pushbutton switch	4-g-17
S45	VARIO cutting table adjustment switch	4-g-17
S46	Cutterbar cross levelling switch (manual)	4-g-17
S69	Cross levelling / table adjustment function pre-selection switch	3-h-17
X8	Ground speed control lever connector	4-h-17
XE	Feed rake conveyor connector	5-g-19
Y67	Solenoid coil AUTOCONTOUR cross levelling, left	7-f-17
Y68	Solenoid coil AUTOCONTOUR cross levelling, right	7-f-17
Y85	Raise front attachment solenoid coil	5-n-20
Y87	Lower front attachment solenoid coil	5-n-20

Measured value table:

Item	Component	Measured value	Remark
K5 K6 K7 K8	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y67 Y68 Y85 Y87	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Front attachment raise/lower

When the road travel circuit is unlocked, relays K5 and K6 are supplied with power by relay K49. The pushbuttons (S38a and S38b) have different pressure stages. When actuating the pushbutton slightly to the first stage, earth is connected as a signal to the AUTOCONTOUR module (A8). The module (A8) actuates the respective solenoid coils (Y85 or Y86) in a modulated way – Slowly raise/lower function.
When pressing the pushbuttons (S38a or S38b) to the second stage, the corresponding relays K5 and K6 are actuated and consequently also the respective solenoid coils (Y85 or Y86) – Quickly raise/lower function.

The master valve (Y77) is actuated via the diode PCB (DO) in parallel with the front attachment raise solenoid coil (Y85) because this function requires that pressure is built up in the system.

During automatic cutterbar guiding, the AUTOCONTOUR module (A8) actuates the corresponding solenoid coils until the set and actual values of the corresponding sensors match – circuit diagram 24a.

Cross levelling

When the road travel circuit is unlocked, relays K7 and K8 are supplied with power by relay K49. By actuating the function pre-selection switch (S69) to the cross levelling position, the respective relay K5 or K6 and consequently the corresponding solenoid coil (Y67/Y68) is actuated as a function of switch (S46).

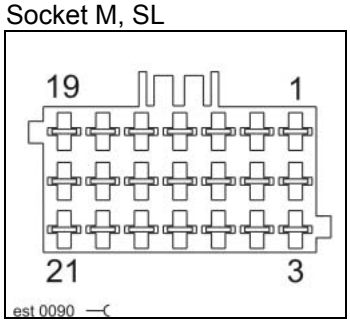
The AUTOCONTOUR module (A8) also receives the signal from the manual cross levelling in parallel with the cross levelling solenoid coils (Y67/Y68). The master valve (Y77) is now actuated via the diode PCB (DO) by the AUTOCONTOUR module (A8) because this function requires that pressure is built up in the system.

During automatic cutterbar guiding, the AUTOCONTOUR module (A8) actuates the corresponding solenoid coils until the set values and actual values of the corresponding sensors match.

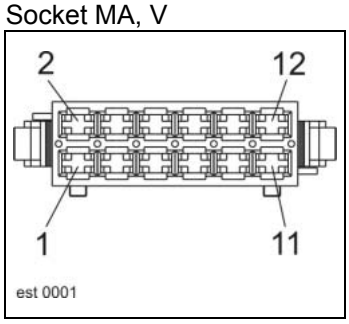
Important! The switch provided at the bottom side of the multi-function handle controls both the VARIO cutting table adjustment (S45) and the manual cutterbar cross levelling (S46), depending on the function pre-selection switch (S69).

Connector pin definition:

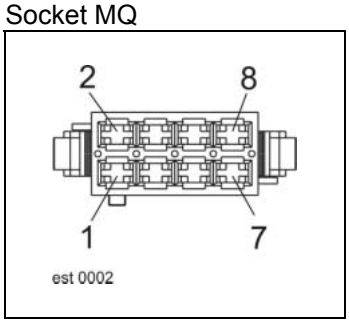
Socket M, SL



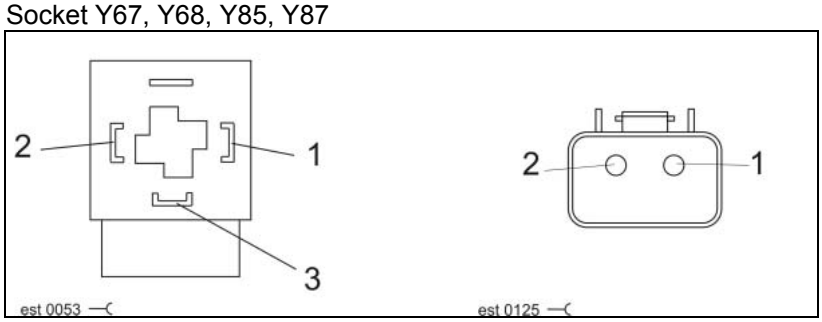
Socket MA, V



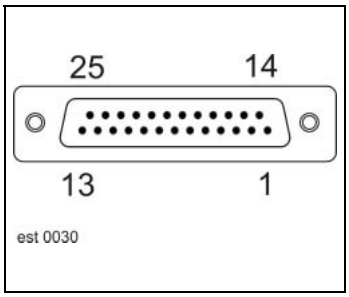
Socket MQ



Socket Y67, Y68, Y85, Y87



Socket X8



Interconnection list:

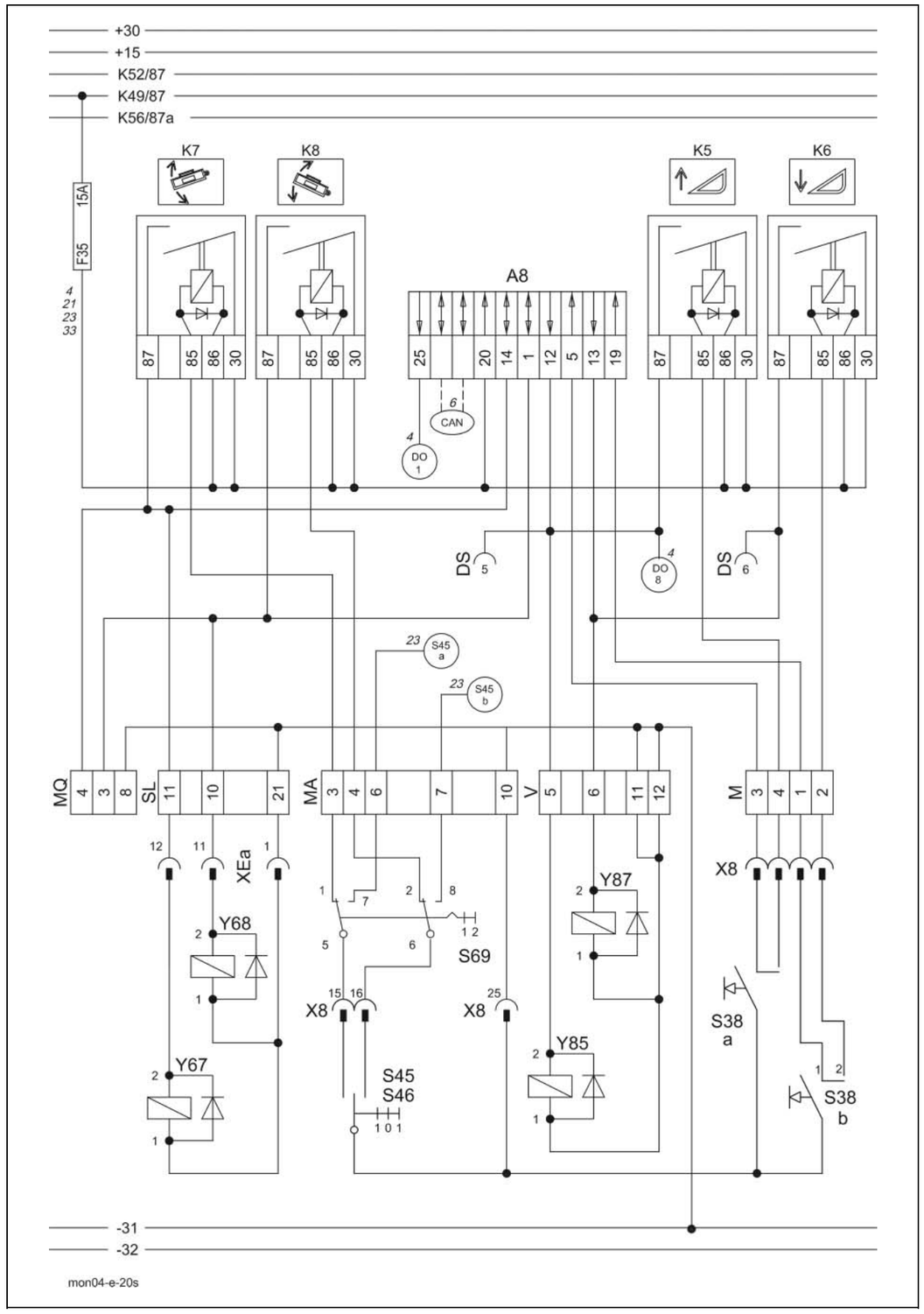
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
M 1	A8 19					0.5	gn-rd
M 2	K6 85					0.5	gn-bk
M 3	A8 5					0.5	ye-bl
M 4	K5 85					0.5	ye-bk
MA 3	K7 85					1.5	gn-wh
MA 4	K8 85					1.5	gn-ye
MA 6	K9 85					1.0	bl-vi
MA 7	K10 85					1.0	bl-ye
MA 10	-31					1.5	br
MQ 3	K8 87	A8 1	SL 10			1.5	rd-vi
MQ 4	K7 87	A8 14	SL 11			1.5	bk-pi
MQ 8	-31					1.5	br
SL 10	K8 87	A8 1	MQ 3				
SL 11	K7 87	A8 14	MQ 4				
V 5	K5 87	A8 12	DO 8	DS 5		1.5	wh-rd
V 6	K6 87	A8 13	DS 6			1.5	wh-bk
V 11	-31					2.5	br
V 12	-31					2.5	br
X8-1						0.5	gn-rd
X8-2						0.5	gn-bk
X8-3						0.5	ye-bl
X8-4						0.5	ye-bk
X8-25						1.5	br
XE-31						1.5	rd-vi
XE-L						1.5	bk-pi
XE-R						1.5	br

20s

Raise/lower front attachment, cross levelling

Montana 570-520

20s Raise/lower front attachment, cross levelling - Montana 570-520



Key to diagram:

Coordinates

A8	AUTOCONTOUR module (CAC)	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K5	Front attachment raise relay	4-i-20
K6	Front attachment lower relay	4-i-20
K7	Left-hand cutterbar transverse control relay	4-i-20
K8	Right-hand cutterbar transverse control relay	4-i-20
K49	Road travel main relay	4-i-20
S38a	Front attachment raise multifunction pushbutton switch	4-g-17
S38b	Front attachment lower multifunction pushbutton switch	4-g-17
S45	VARIO cutting table adjustment switch	4-g-17
S46	Cutterbar cross levelling switch (manual)	4-g-17
S69	Cross levelling / table adjustment function pre-selection switch	3-h-17
X8	Ground speed control lever connector	4-h-17
XEa	Feeder housing connector	5-g-19
Y67	Solenoid coil AUTOCONTOUR cross levelling, left	7-f-17
Y68	Solenoid coil AUTOCONTOUR cross levelling, right	7-f-17
Y85	Raise front attachment solenoid coil	5-n-20
Y87	Lower front attachment solenoid coil	5-n-20

Note: On MONTANA machines, the swing angle and the cutting angle can be varied by adjusting the front attachment frame, in addition to the CAC function – see circuit diagram 41s and 41t.

Measured value table:

Item	Component	Measured value	Remark
K5 K6 K7 K8	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y67 Y68 Y85 Y87	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function: 1/2

Raise / lower front attachment

When the road travel circuit is unlocked, relays K5 and K6 are supplied with power by relay K49. The pushbuttons (S38a and S38b) have different pressure stages. When actuating the pushbutton slightly to the first stage, earth is connected as a signal to the AUTOCONTOUR module (A8). The module (A8) actuates the respective solenoid coils (Y85 or Y86) in a modulated way – Slowly raise/lower function.
When pressing the pushbuttons (S38a or S38b) to the second stage, the corresponding relays K5 and K6 are actuated and consequently also the respective solenoid coils (Y85 or Y86) – Quickly raise/lower function.

The master valve (Y77) is actuated via the diode PCB (DO) in parallel with the front attachment raise solenoid coil (Y85) because this function requires that pressure is built up in the system.

During automatic cutterbar guiding, the AUTOCONTOUR module (A8) actuates the corresponding solenoid coils until the set values and actual values of the corresponding sensors match – Circuit diagram 24a.

Cross levelling

When the road travel circuit is unlocked, relays K7 and K8 are supplied with power by relay K49. By actuating the function pre-selection switch (S69) to the cross levelling position, the respective relay K5 or K6 and consequently the corresponding solenoid coil (Y67/Y68) is actuated as a function of switch (S46).

The AUTOCONTOUR module (A8) also receives the signal from the manual lateral control in parallel with the lateral control solenoid coils (Y67/Y68). The master valve (Y77) is now actuated via the diode PCB (DO) by the AUTOCONTOUR module (A8) because this function requires that pressure is built up in the system.

During automatic cutterbar guiding, the AUTOCONTOUR module (A8) actuates the corresponding solenoid coils until the set values and actual values of the corresponding sensors match.

Note: The switch provided at the bottom side of the multi-function handle controls both the VARIO cutting table adjustment (S45) and the manual cutterbar cross levelling (S46), depending on the function pre-selection switch (S69).

MONTANA cross levelling

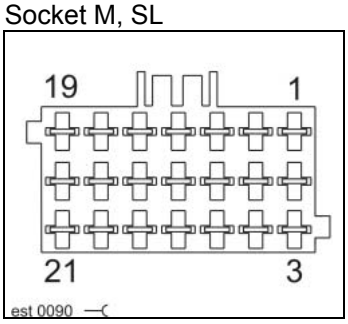
Note: On MONTANA machines, the swing angle and the cutting angle can be varied by adjusting the front attachment frame, in addition to the CAC function – see circuit diagram 41s and 41t.

Description of function: 2/2

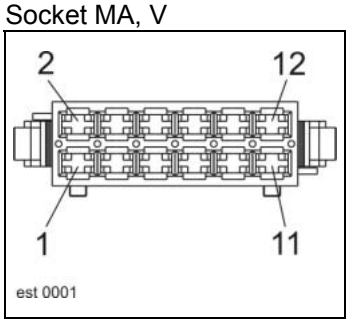
AUTOCONTOUR (CAC) Settings for Montana machines	The adaptation of the AUTOCONTOUR (CAC) and the axle control systems requires special settings for Montana machines.
- Cutterbar spring setting	The 5 mm cutterbar spring setting (see also Operator's Manual) must be made at a 50 % axle position.
- Check of cutterbar spring setting	Check setting dimension when travelling downhill with the axle cylinders fully extended. This dimension may be only < 15 mm.
- Learning the CAC limit stops	The limit stops of the CAC sensors must be learned at a 75 % axle position. While doing this, the cutting angle must be adjusted to the working position (cutterbar table surface in parallel with the ground).
- CAC sensitivity	The recommended CAC sensitivity for use with the grain cutterbar is 45 % with Montana machines.
- Drop rate setting (front attachment)	The drop rate must be adjusted with the machine at operating temperature and 50 % axle position. The drop rate is 5 – 6 seconds from the top to the bottom position.
- Set value adjustment of CAC cutting height control	When working in the field, the cutting height control set value (working within the sensor band range) should not be set higher than position 8.

Connector pin definition:

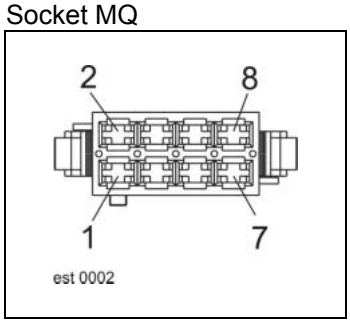
Socket M, SL



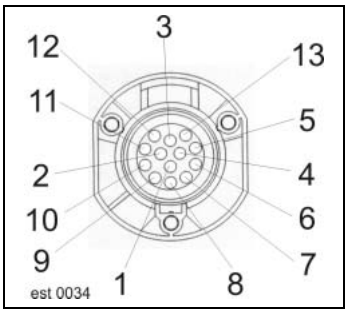
Socket MA, V



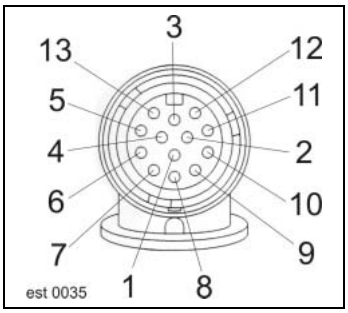
Socket MQ



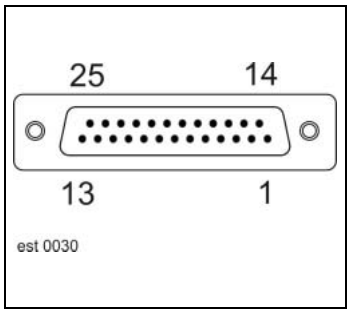
Socket XEa



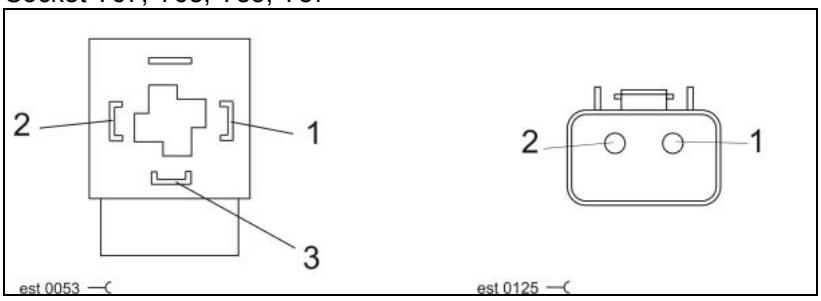
Connector XEa



Socket X8



Socket Y67, Y68, Y85, Y87



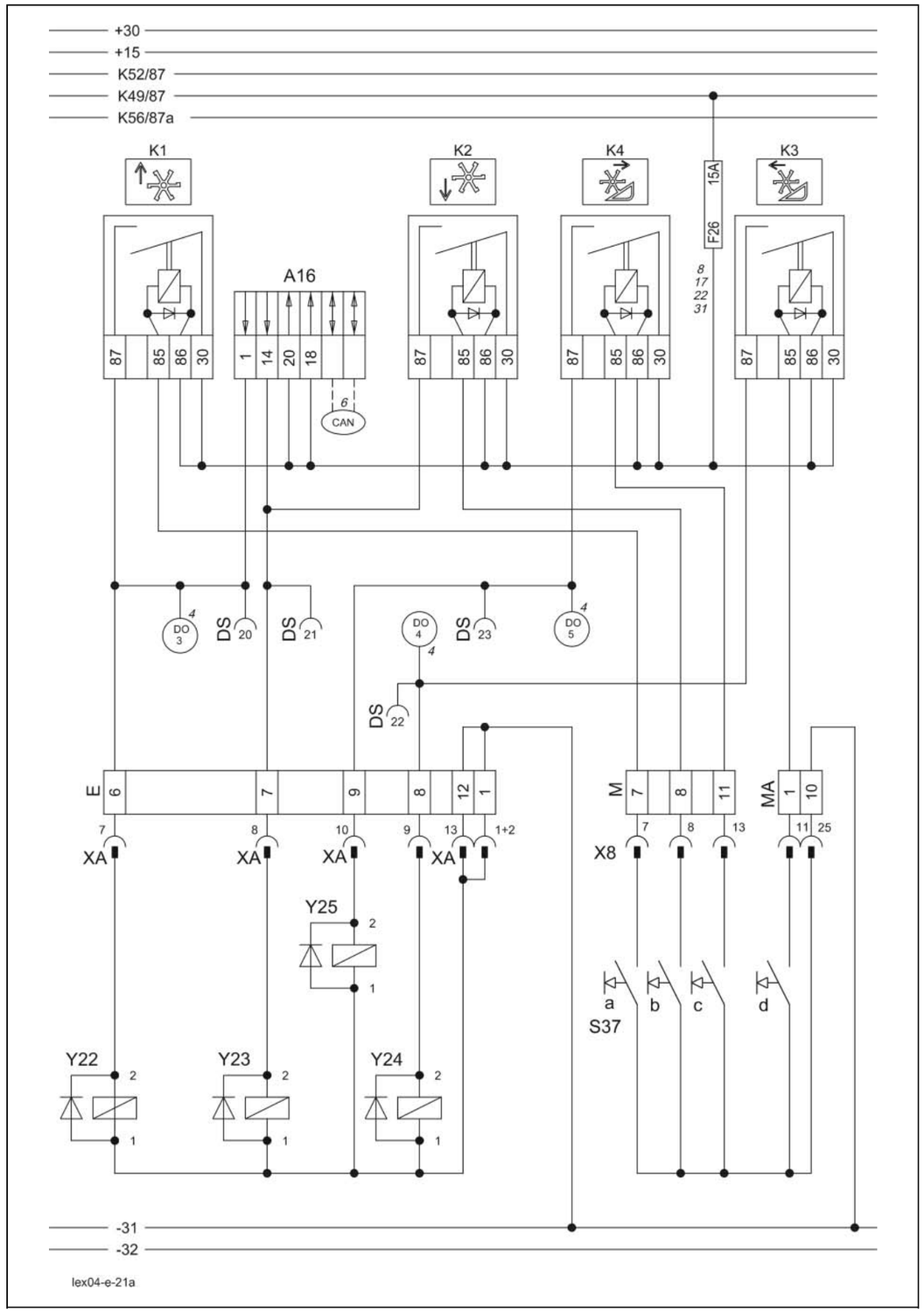
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
M 1	A8 19					0.5	gn-rd
M 2	K6 85					0.5	gn-bk
M 3	A8 5					0.5	ye-bl
M 4	K5 85					0.5	ye-bk
MA 3	K7 85					1.5	gn-wh
MA 4	K8 85					1.5	gn-ye
MA 6	K9 85					1.0	bl-vi
MA 7	K10 85					1.0	bl-ye
MA 10	-31					1.5	br
MQ 3	K8 87	A8 1	SL 10				
MQ 4	K7 87	A8 14	SL 11				
MQ 8	-31						
SL 10	K8 87	A8 1	MQ 3			1.0	rd-vi
SL 11	K7 87	A8 14	MQ 4			1.0	bk-pi
SL 21						2.5	br
V 5	K5 87	A8 12	DO 8	DS 5		1.5	wh-rd
V 6	K6 87	A8 13	DS 6			1.5	wh-bk
V 11	-31					2.5	br
V 12	-31					2.5	br
X8-1						0.5	gn-rd
X8-2						0.5	gn-bk
X8-3						0.5	ye-bl
X8-4						0.5	ye-bk
X8-25						1.5	br
XE-31						1.5	rd-vi
XE-L						1.5	bk-pi
XE-R						1.5	br

21a

Reel adjustment
Standard cutterbar

21a Reel adjustment - Standard cutterbar



Key to diagram:

		Coordinates
A16	Reel controller module (HAS)	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K1	Reel raise relay	4-i-20
K2	Reel lower relay	4-i-20
K3	Reel forward relay	4-i-20
K4	Reel backward relay	4-i-20
K49	Road travel main relay	4-i-20
S37a	Reel raise multifunction pushbutton switch	4-g-17
S37b	Reel lower multifunction pushbutton switch	4-g-17
S37c	Reel backward multifunction pushbutton switch	4-g-17
S37d	Reel forward multifunction pushbutton switch	4-g-17
X8	Ground speed control lever connector	4-h-17
XA	Multifunction coupling A connector	8-f-20
Y22	Reel raise solenoid coil	8-f-20
Y23	Reel lower solenoid coil	8-f-20
Y24	Reel forward solenoid coil	8-f-20
Y25	Reel backward solenoid coil	8-f-20

Measured value table:

Item	Component	Measured value	Remark
K1 K2 K3 K4	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y22 Y23 Y24 Y25	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Reel adjustment

When the road travel circuit is unlocked, the relays K1, K2, K3, and K4 are supplied with voltage on pin 30 and pin 86. The corresponding pushbutton (S37a/b/c/d) controls the relay K1, K2, K3 or K4 and thus the respective solenoid coil (Y22/Y23/Y24/25).

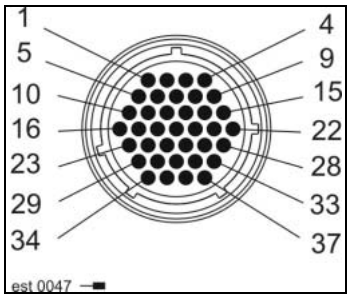
The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y22/Y23/Y24/25) because this function requires that pressure is built up in the system.

If the automatic cutterbar system is activated, the automatic reel controller module (A16) ensures actuation of the solenoid coils (Y22/Y23) and control of the master valve (Y77). In the process, the setting for the reel height in the terminal (A30) is compared to the actual value of the sensor (B39) (see also diagram 24).

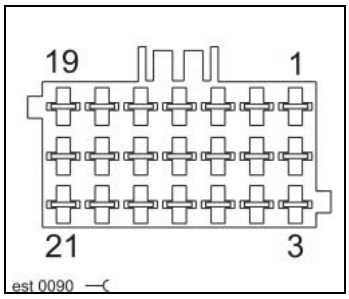
Important! An automatic function for horizontal reel adjustment is available only for VARIO cutterbars (see also diagram 21b).

Connector pin definition:

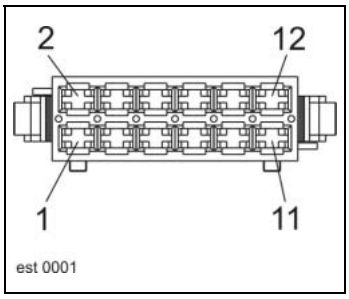
Connector E



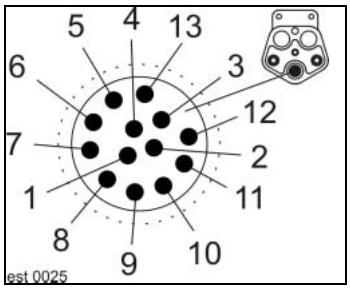
Socket M



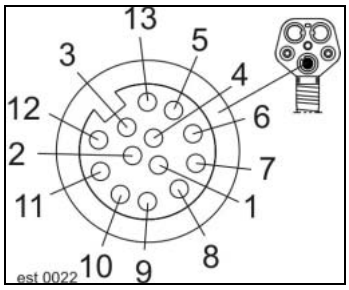
Socket MA



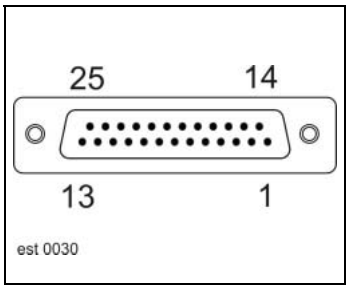
Connector XA



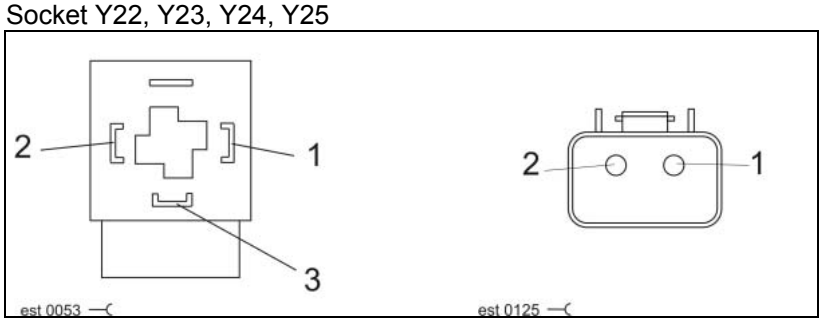
Socket XA



Socket X8



Socket Y22, Y23, Y24, Y25



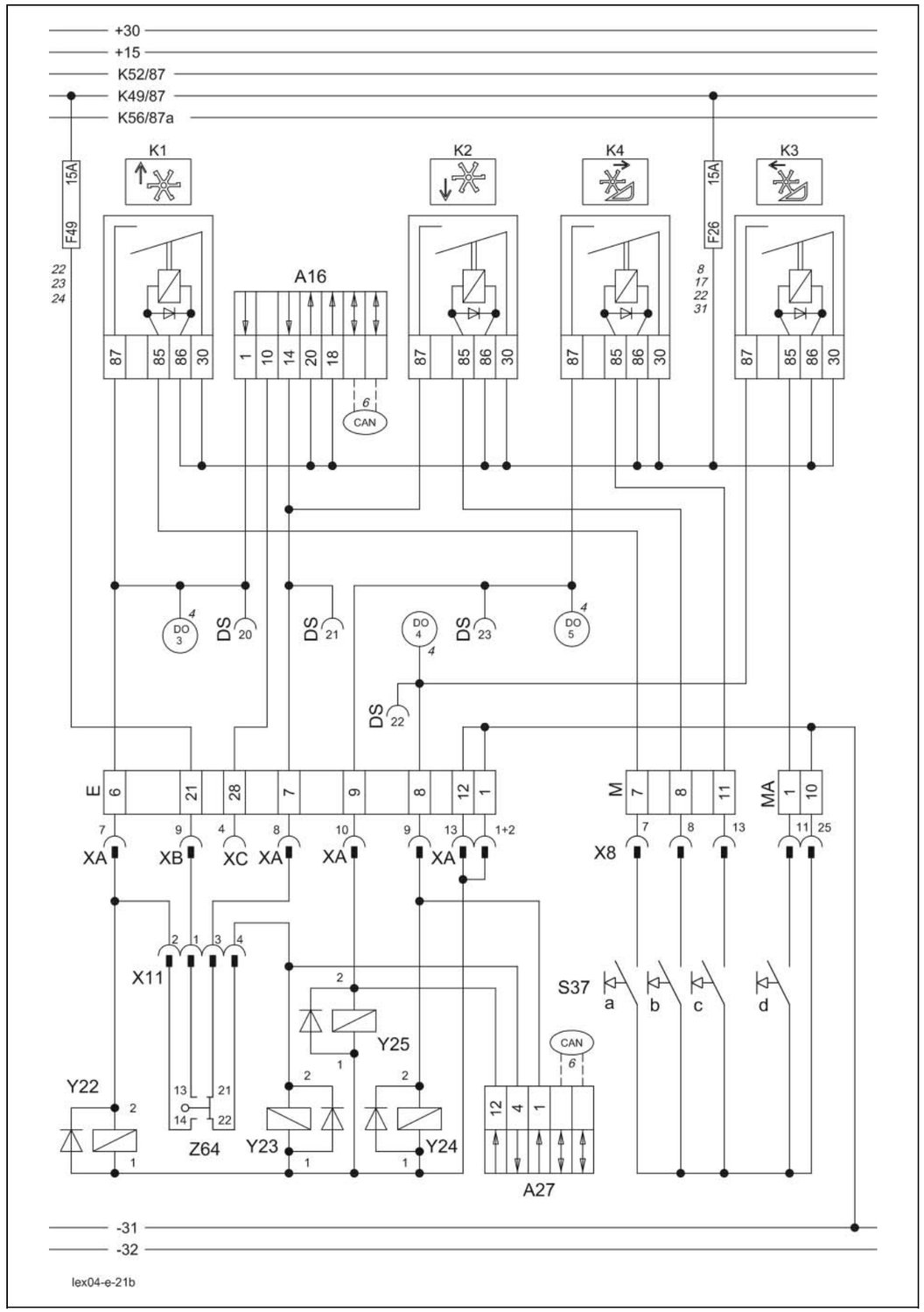
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 6	K1 87	A16 1	DO 3	DS 20		1.5	gn-gr
E 7	K2 87	A16 14	DS 21			1.5	gn-wh
E 8	K3 87	DO 4	DS 22			1.5	gn-rd
E 9	K4 87	DO 5	DS 23			1.5	gn-bl
E 12	-31					1.5	br
E 21	F49 a	K9 30	K9 86	K10 30	K10 86	1.5	bl-rd
E 28	A16 10					0.75	bl-wh
M 7	K1 85					0.5	rd-bk
M 8	K2 85					0.5	rd-wh
M 11	K4 85					0.5	gr-wh
MA 1	K3 85					0.5	gr-rd
MA 10	-31					1.5	br
X8-7						0.5	rd-bk
X8-8						0.5	rd-wh
X8-11						0.5	gr-rd
X8-13						0.5	gr-wh
X8-25						1.5	br
XA-7						1.5	gn-gr
XA-8						1.5	gn-wh
XA-9						1.5	gn-rd
XA-10						1.5	gn-bl
XA-13						1.5	br

21b

Reel adjustment
VARIO cutterbar

21b Reel adjustment - VARIO cutterbar



Key to diagram:

		Coordinates
A16	Reel controller module (HAS)	2-i-20
A27	VARIO module	8-f-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K1	Reel raise relay	4-i-20
K2	Reel lower relay	4-i-20
K3	Reel forward relay	4-i-20
K4	Reel backward relay	4-i-20
K49	Road travel main relay	4-i-20
S37a	Reel raise multifunction pushbutton switch	4-g-17
S37b	Reel lower multifunction pushbutton switch	4-g-17
S37c	Reel backward multifunction pushbutton switch	4-g-17
S37d	Reel forward multifunction pushbutton switch	4-g-17
X8	Ground speed control lever connector	4-h-17
X11	VARIO cutterbar sensors connector	7-e-25
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20
Y22	Reel raise solenoid coil	8-f-20
Y23	Reel lower solenoid coil	8-f-20
Y24	Reel forward solenoid coil	8-f-20
Y25	Reel backward solenoid coil	8-f-20
Z64	VARIO reel emergency lift actual value switch	8-c-26

Measured value table:

Item	Component	Measured value	Remark
K1 K2 K3 K4	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y22 Y23 Y24 Y25	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Reel adjustment

When the road travel circuit is unlocked, the relays K1, K2, K3, and K4 are supplied with voltage on pin 30 and pin 86. The corresponding pushbutton (S37a/b/c/d) controls the relay K1, K2, K3 or K4 and thus the respective solenoid coil (Y22/Y23/Y24/25).

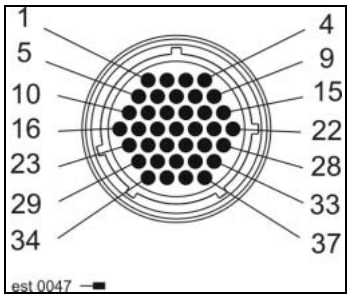
The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y22/Y24/25) because this function requires that pressure is built up in the system.

When activating the automatic cutterbar function on machines equipped with CEBIS, the automatic reel controller module (A16) ensures actuation of the reel height whereas the VARIO module (A27) is responsible for adjusting the cutting table and the reel horizontally. In this process, the settings in the terminal (A30) are compared to the actual values of the sensors (B39/B40/B70) and/or of the potentiometers (R11/R12/R30).

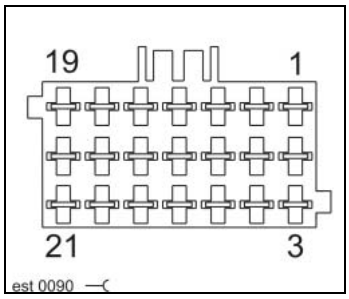
The limit switch (Z64) ensures that the reel will never collide vertically with the cutting table and/or will not lower onto the knife. On the V-belt spring tensioner, the limit switch (Z64) avoids that the rape position is selected when the V-belt is installed.

Connector pin definition:

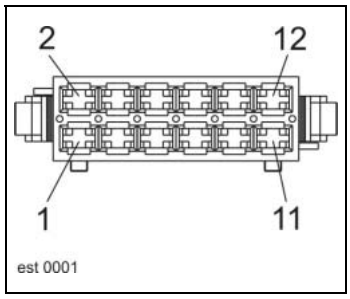
Connector E



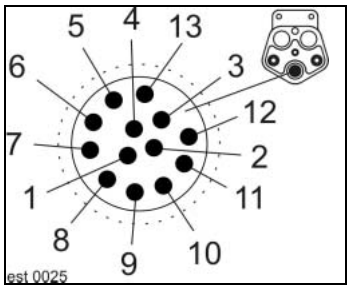
Socket M



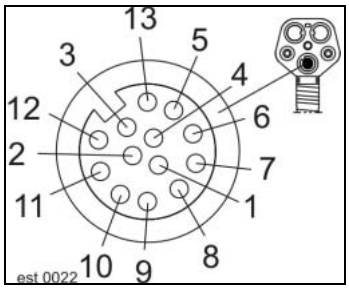
Socket MA



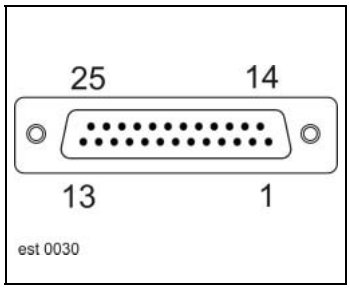
Connector XA



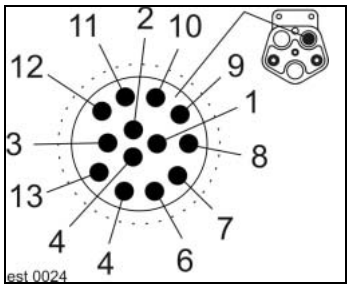
Socket XA



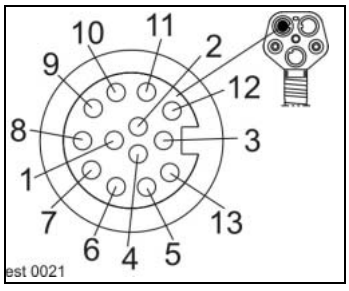
Socket X8



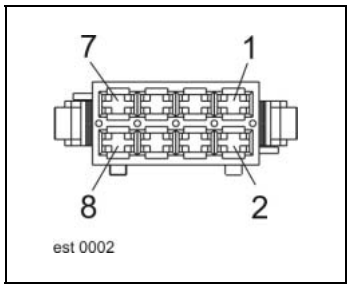
Connector XB



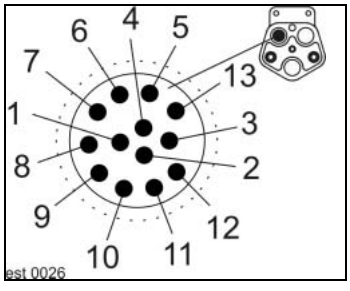
Socket XB



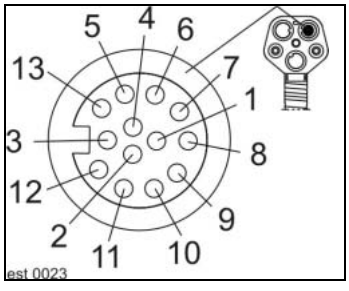
Socket X11



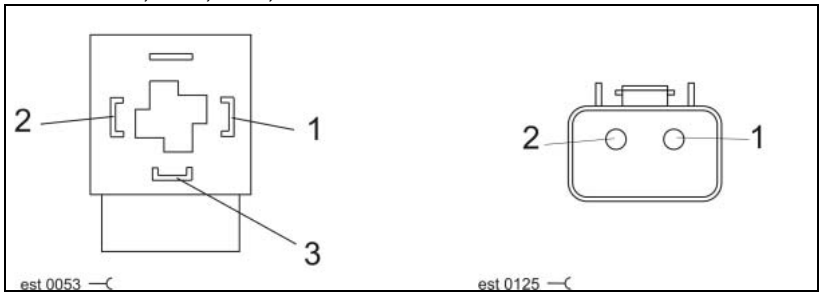
Connector XC



Socket XC



Socket Y22, Y23, Y24, Y25



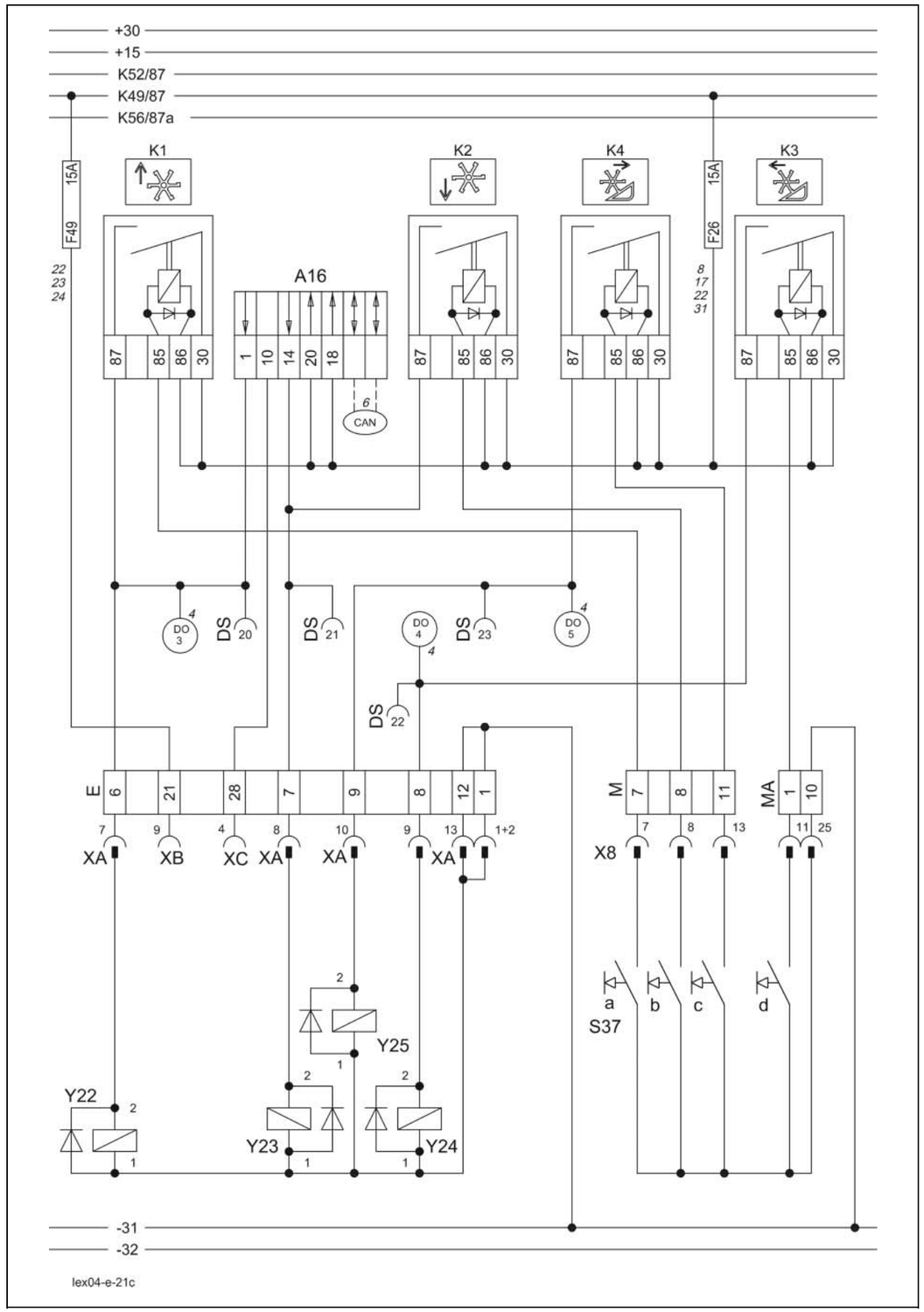
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 6	K1 87	A16 1	DO 3	DS 20		1.5	gn-gr
E 7	K2 87	A16 14	DS 21			1.5	gn-wh
E 8	K3 87	DO 4	DS 22			1.5	gn-rd
E 9	K4 87	DO 5	DS 23			1.5	gn-bl
E 12	-31					1.5	br
E 21	F49 a	K9 30	K9 86	K10 30	K10 86	1.5	bl-rd
E 28	A16 10					0.75	bl-wh
M 7	K1 85					0.5	rd-bk
M 8	K2 85					0.5	rd-wh
M 11	K4 85					0.5	gr-wh
MA 1	K3 85					0.5	gr-rd
MA 10	-31					1.5	br
X8-7						0.5	rd-bk
X8-8						0.5	rd-wh
X8-11						0.5	gr-rd
X8-13						0.5	gr-wh
X8-25						1.5	br
X11-1						1.5	bl
X11-2						1.5	gn-ye
X11-3						1.5	gn-wh
X11-4						1.5	gn
XA-7						1.5	gn-gr
XA-8						1.5	gn-wh
XA-9						1.5	gn-rd
XA-10						1.5	gn-bl
XA-13						1.5	br
XB-9						1.5	bl-rd
XC-4						0.75	bl-wh

21c

Reel adjustment
Folding cutterbar

21c Reel adjustment - Folding cutterbar



Key to diagram:

		Coordinates
A16	Reel controller module (HAS)	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K1	Reel raise relay	4-i-20
K2	Reel lower relay	4-i-20
K3	Reel forward relay	4-i-20
K4	Reel backward relay	4-i-20
K49	Road travel main relay	4-i-20
S37a	Reel raise multifunction pushbutton switch	4-g-17
S37b	Reel lower multifunction pushbutton switch	4-g-17
S37c	Reel backward multifunction pushbutton switch	4-g-17
S37d	Reel forward multifunction pushbutton switch	4-g-17
X8	Ground speed control lever connector	4-h-17
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20
Y22	Reel raise solenoid coil	8-f-20
Y23	Reel lower solenoid coil	8-f-20
Y24	Reel forward solenoid coil	8-f-20
Y25	Reel backward solenoid coil	8-f-20

Measured value table:

Item	Component	Measured value	Remark
K1 K2 K3 K4	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y22 Y23 Y24 Y25	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Reel adjustment

When the road travel circuit is unlocked, the relays K1, K2, K3, and K4 are supplied with voltage on pin 30 and pin 86. The corresponding pushbutton (S37a/b/c/d) controls the relay K1, K2, K3 or K4 and thus the respective solenoid coil (Y22/Y23/Y24/25).

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y22/Y24/25) because this function requires that pressure is built up in the system.

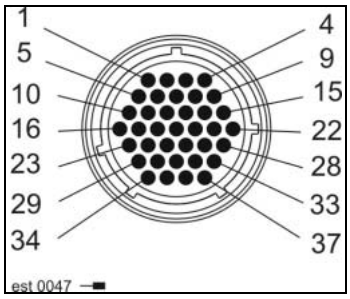
If the automatic cutterbar system is activated on machines equipped with CEBIS, the automatic reel controller module (A16) ensures actuation of the solenoid coils (Y22/Y23) and control of the master valve (Y77). In the process, the setting for the reel height in the terminal (A30) is compared to the actual value of the sensor (B39) (see also diagram 24).

Important! An automatic function for horizontal reel adjustment is available only for VARIO cutterbars (see also diagram 21b).

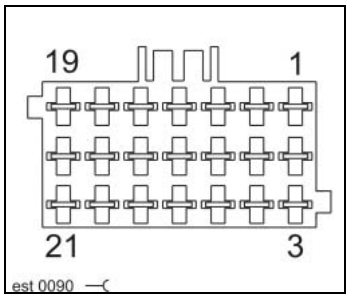
Important! The cutterbar can be folded only after the reel rear end position limit switch (Z14) has been actuated – circuit diagram 23a.

Connector pin definition:

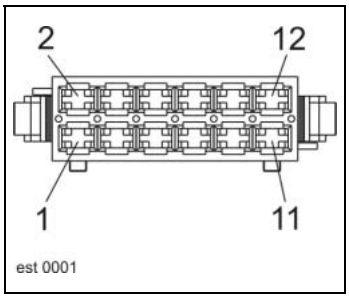
Connector E



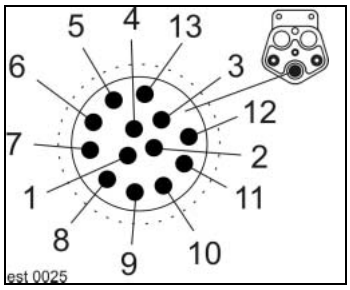
Socket M



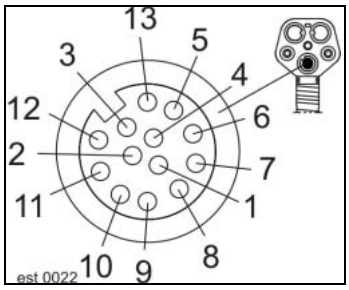
Socket MA



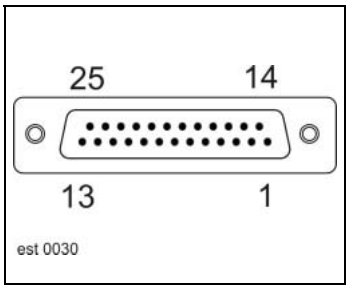
Connector XA



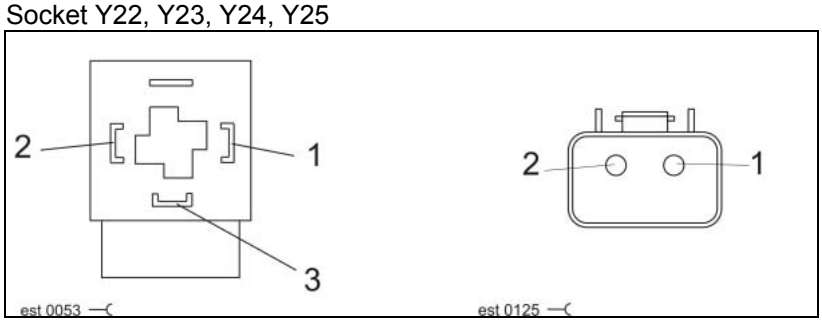
Socket XA



Socket X8



Socket Y22, Y23, Y24, Y25



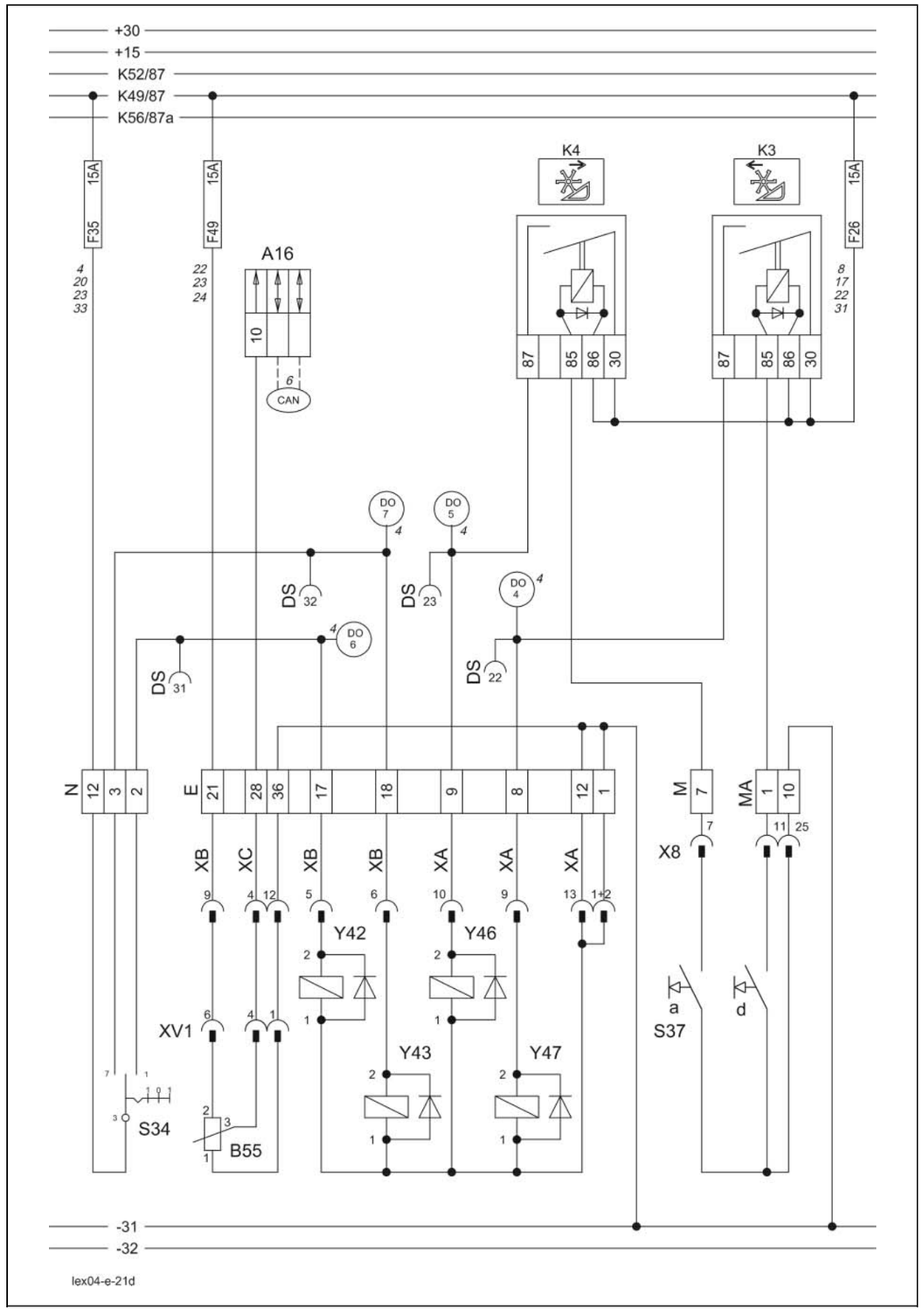
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 6	K1 87	A16 1	DO 3	DS 20		1.5	gn-gr
E 7	K2 87	A16 14	DS 21			1.5	gn-wh
E 8	K3 87	DO 4	DS 22			1.5	gn-rd
E 9	K4 87	DO 5	DS 23			1.5	gn-bl
E 12	-31					1.5	br
E 21	F49 a	K9 30	K9 86	K10 30	K10 86	1.5	bl-rd
E 28	A16 10					0.75	bl-wh
M 7	K1 85					0.5	rd-bk
M 8	K2 85					0.5	rd-wh
M 11	K4 85					0.5	gr-wh
MA 1	K3 85					0.5	gr-rd
MA 10	-31					1.5	br
X8-7						0.5	rd-bk
X8-8						0.5	rd-wh
X8-11						0.5	gr-rd
X8-13						0.5	gr-wh
X8-25						1.5	br
XA-7						1.5	gn-gr
XA-8						1.5	gn-wh
XA-9						1.5	gn-rd
XA-10						1.5	gn-bl
XA-13						1.5	br

21d

Folding the maize picker, snapping plate adjustment, down maize augers

21d Folding the maize picker, snapping plate adjustment, down maize augers



Key to diagram:

		Coordinates
A8	AUTOCONTOUR module (CAC)	2-i-20
A16	Reel controller module (HAS)	2-i-20
B55	Snapping plate position sensor	8-e-18
DO	Circulation shut-off valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K3	Reel forward relay	4-i-20
K4	Reel backward relay	4-i-20
K49	Road travel main relay	4-i-20
S34	Maize cutterbar fold switch	3-h-17
S37c	Reel backward multifunction pushbutton switch	4-g-17
S37d	Reel forward multifunction pushbutton switch	4-g-17
X8	Ground speed control lever connector	4-h-17
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20
XC	Multifunction coupling C connector	8-f-20
XV1	AUTOCONTOUR variant plug connector	8-f-20
Y42	Fold maize picker to working position solenoid coil	7-f-20
Y43	Fold maize picker to transport position solenoid coil	7-f-20
Y46	Snapping plate clearance narrow solenoid coil	7-f-20
Y47	Snapping plate clearance wide solenoid coil	7-f-20

Measured value table:

Item	Component	Measured value	Remark
B71	Sensor	12 V 0.25 V – 4.75 V	(Pin 1-2) (Pin 1-3)
K3 K4	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y42 Y43 Y46 Y47	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Folding the maize picker / Snapping plate adjustment

When the road travel circuit is unlocked, relays K3, K4 and the fold maize picker switch (S34) are supplied with power by relay K49. The pushbuttons (37c/37d) actuate one of the two solenoid coils (Y46/Y47) via the corresponding relay K3 or K4 for snapping plate adjustment whereas switch (S34) directly controls the solenoid coils (Y42/Y43) in order to fold the picker.

The master valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y42/Y43/Y46/Y47) because this function requires that pressure is built up in the system.

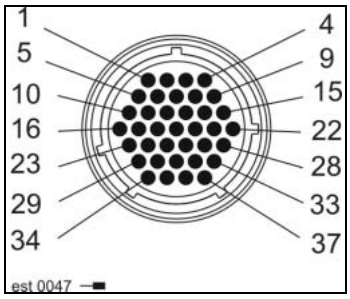
The reel controller module (HAS) (A16) converts the analogue signal from sensor (B55) into a digital signal which is displayed on terminal (A30) via the CAN bus. Sensor (B55) receives the necessary 12 V reference voltage from the actuated road travel main relay K49/87.

Down maize auger drive

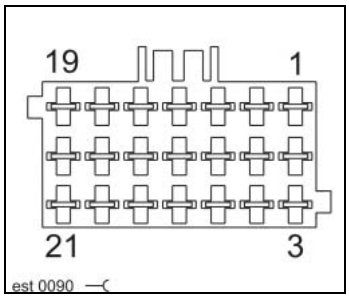
The down maize augers are driven hydraulically by the reel drive variable displacement pump. The reel controller module (A16) controls the speed – circuit diagram 22a
The speed adjustment is by means of the +/- keys on the terminal (A30). Since there is no speed sensor for speed monitoring/control, the automatic reel speed control in the terminal (A30) must be switched off.

Connector pin definition:

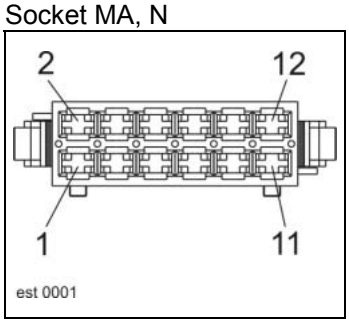
Connector E



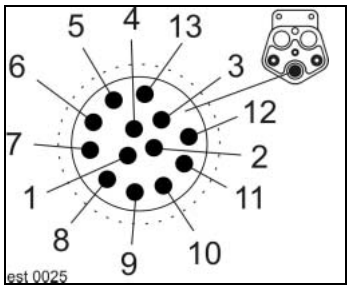
Socket M



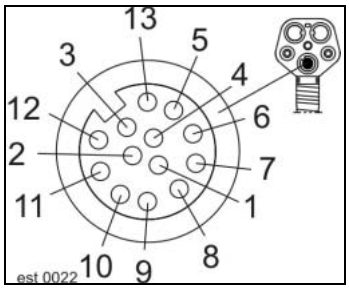
Socket MA, N



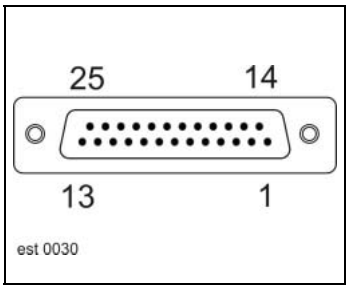
Connector XA



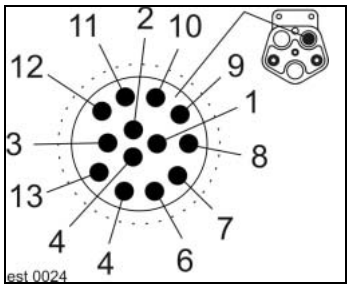
Socket XA



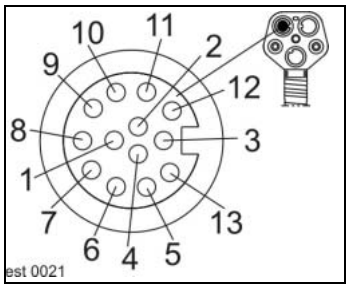
Socket X8



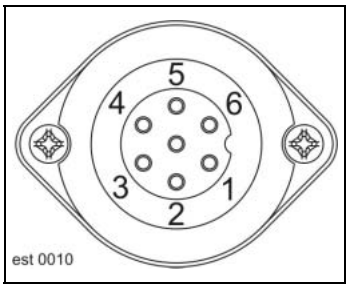
Connector XB



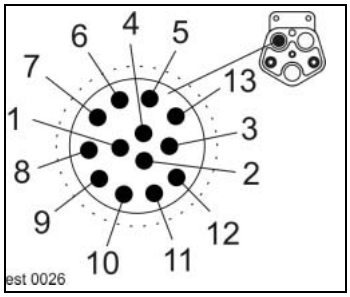
Socket XB



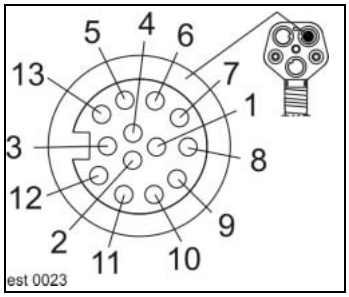
Socket XV1



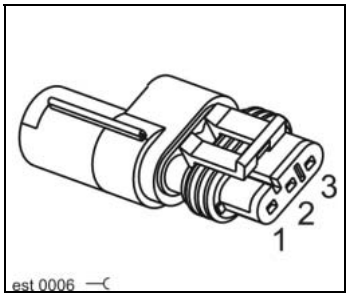
Connector XC



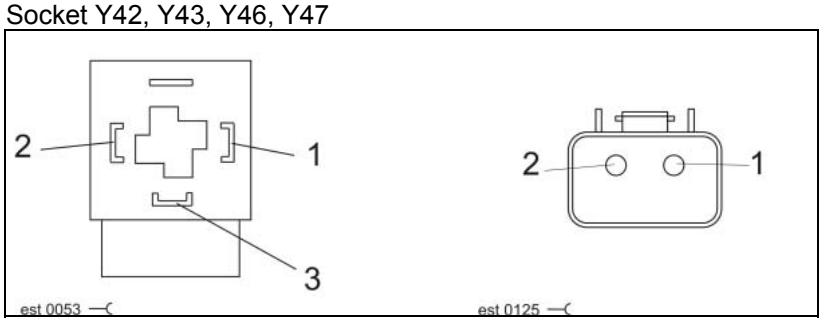
Socket XC



Socket B55



Socket Y42, Y43, Y46, Y47



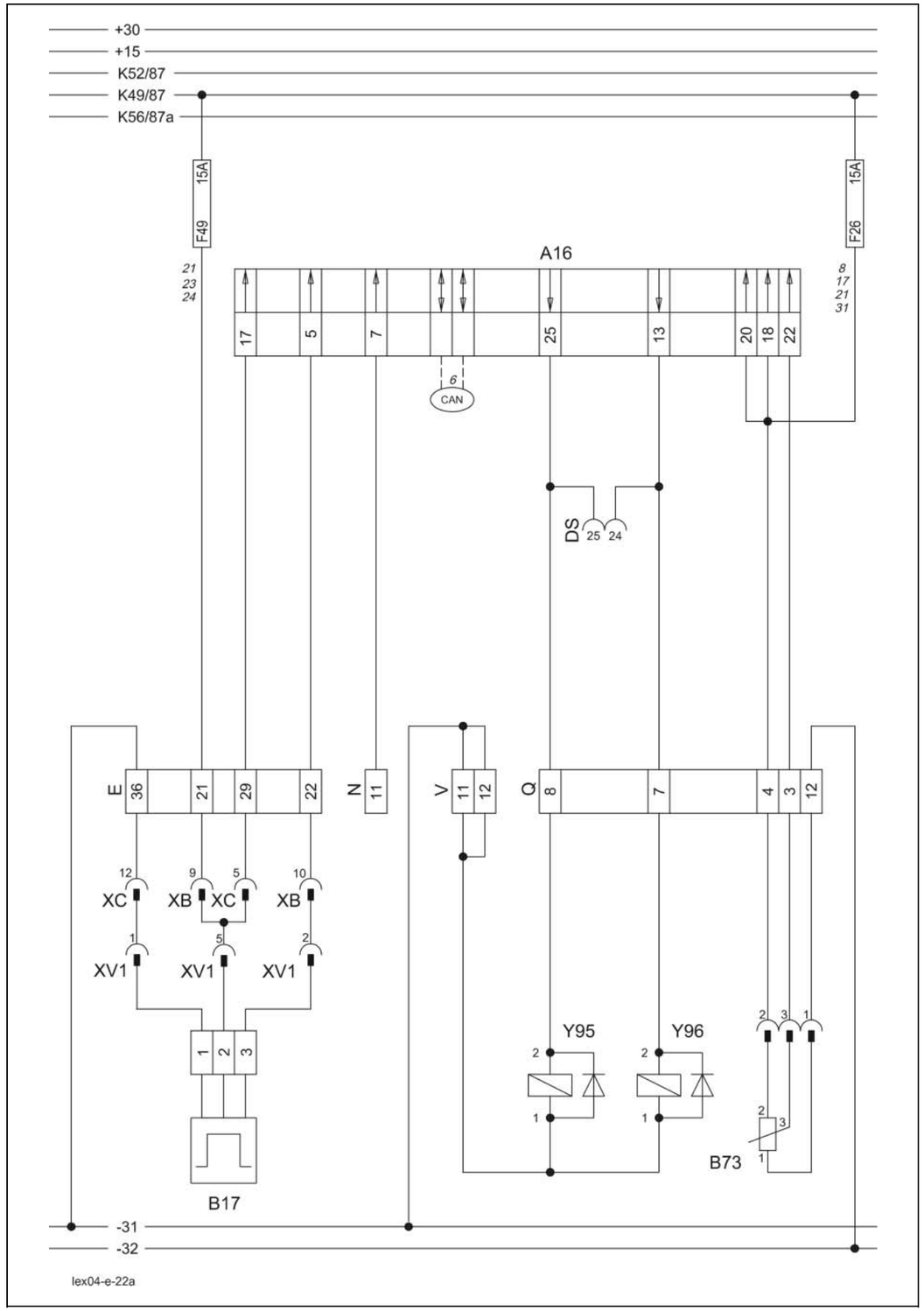
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 8	K3 87	DO 4	DS 22			1.5	gn-rd
E 9	K4 87	DO 5	DS 23			1.5	gn-bl
E 12	-31					1.5	br
E 17	N 2	DO 6	DS 31			1.5	vi-gr
E 18	N 3	DO 7	DS 32			1.5	vi-ye
E 21	F49 a	K9 30	K9 86	K10 30	K10 86	1.5	bl-rd
E 28	A16 10					0.75	bl-wh
E 36	-31					1.5	br
M 7	K1 85					0.5	rd-bk
MA 1	K3 85					0.5	gr-rd
MA 10	-31					1.5	br
N 2	E 17	DO 6	DS 31			1.5	b-ye
N 3	E 18	DO 7	DS 32			1.5	br-vi
X8-7						0.5	rd-bk
X8-11						0.5	gr-rd
X8-25						1.5	br
XA-9						1.5	gn-rd
XA-10						1.5	gn-bl
XA-13						1.5	br
XB-5						1.5	vi-gr
XB-6						1.5	vi-ye
XB-9						1.5	bl-rd
XC-4						0.75	bl-wh
XC-12						1.5	gn-bk
XV1-1						0.75	br
XV1-4						0.75	or-wh
XV1-6						0.75	rd-ye

22a

Reel variable-speed drive

22a Reel variable-speed drive



Key to diagram:

Coordinates

A16	Reel controller module (HAS)	2-i-20
B17	Reel speed sensor	7-e-10
B73	Reel speed adjustment variable displacement pump sensor	5-k-20
K49	Road travel main relay	4-i-20
XB	Multifunction coupling B connector	8-f-20
XC	Multifunction coupling C connector	8-f-20
XV1	Reel functions variant plug connector	8-f-20
Y95	Reel speed fast solenoid coil	5-k-20
Y96	Reel speed slow solenoid coil	5-k-20

Measured value table:

Item	Component	Measured value	Remark
B17	Sensor digital (0-I)	12 V 0.4 V – 4.6 V	Power supply (Pin 1-3) Signal (Pin 1-2) 0.4 V = LED dark = 0 4.6 V = LED bright = I
B73	Sensor	12 V 0.25 V – 4.75 V	(Pin 1-2) (Pin 1-3)
Y95 Y96	Solenoid coil	0.7 A 17 Ω	See inscription

Description of function: 1/2

Reel variable-speed drive

The hydraulic reel speed control is realised using a variable displacement-type axial piston pump. The pump drive and therefore the sense of rotation depends on the front attachment. A CAN signal is transmitted to the reel controller module (A16) by the +/- pushbuttons provided that the function pre-selection rotary switch (T11) is set to the reel symbol. Module (A16) now actuates the solenoid coils (Y95 or Y96) using pulse-width modulation, depending on the required swivel angle of the variable displacement pump. The sensor (B73) transmits the swivel angle of the variable displacement pump to module (A16).

Note: After shutting down the front attachment, the reel speed slow solenoid valve (Y96) is energised for another 4 seconds in order to fully retract the ram in the reel drive control hydraulic cylinder (356) (zero displacement of pump). The accumulator (512) also supports this process.

Front attachment identification

The axial piston displacement pump is adjusted only if the cutterbar or maize picker with hydraulic down maize augers is engaged and activated. Front attachment identification is by means of reel controller module (A16) on pin 17. If a corresponding front attachment is identified, upon engaging the front attachment the pump swings to the position it had before it was shut down the last time, but at least to 1.2 Volt signal voltage of the reel speed control variable displacement pump sensor (B73). This corresponds to a reel speed of approx. 3.5 km/h (± Offset).

When working without a front attachment or with another non-identified front attachment, there is no adjustment of the axial piston displacement pump. It remains in its basic position.

Reverser drive

When the reversing function is active, a signal is connected to the reel controller module (A16) which makes the speed adjustment variable displacement pump swing to maximum delivery – circuit diagram 17a.

Automatic reel speed

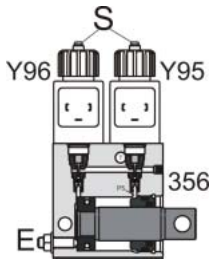
Automatic reel speed control is assumed by the reel controller module (A16) which receives the necessary information about the vehicle's ground speed via the CAN bus connection with the fieldwork computer module (A10). The reel speed (B17) is now adjusted according to the ground speed and the differential speed set value on the CEBIS terminal (A30).

Description of function: 2/2

Reel drive pump basic setting

- hydraulic

In the basic setting, the axial piston pump (213) must be set to zero delivery using the screw E.



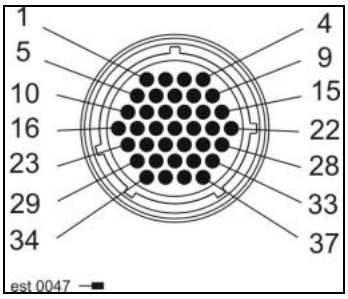
- Engage front attachment
- Start diesel engine
- Engage threshing mechanism
- Front attachment ON
- Turn in screw S on the reel speed slow solenoid valve (Y96) – the ram retracts – the pump swings to „zero delivery“
- Adjust reel speed to zero using screw E
- Complete machine again

- electric

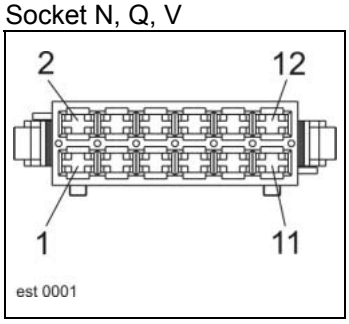
In the basic position of the reel speed control variable-displacement pump sensor (B73), ensure that with the piston fully retracted (pump fully swivelled back), the signal voltage must be 0.5 V (± 0.1 V).

Connector pin definition:

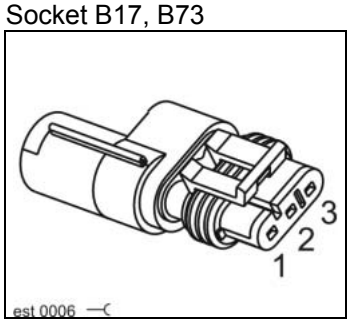
Connector E



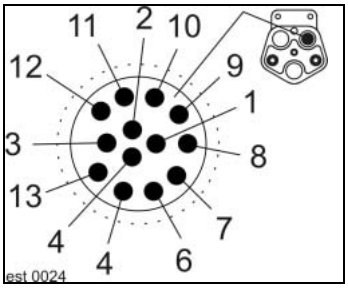
Socket N, Q, V



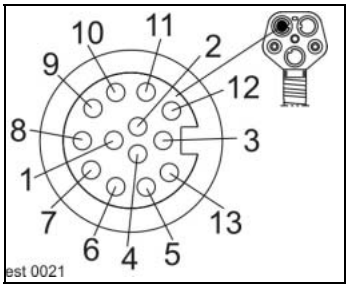
Socket B17, B73



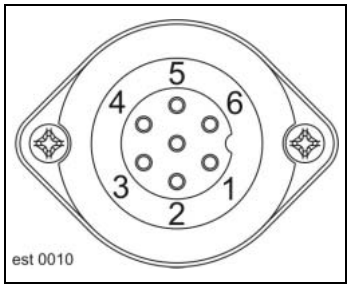
Connector XB



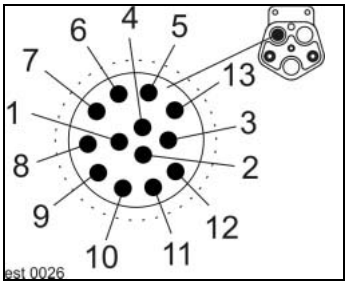
Socket XB



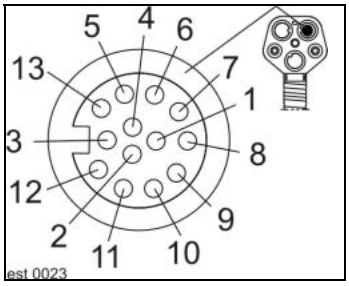
Socket XV1



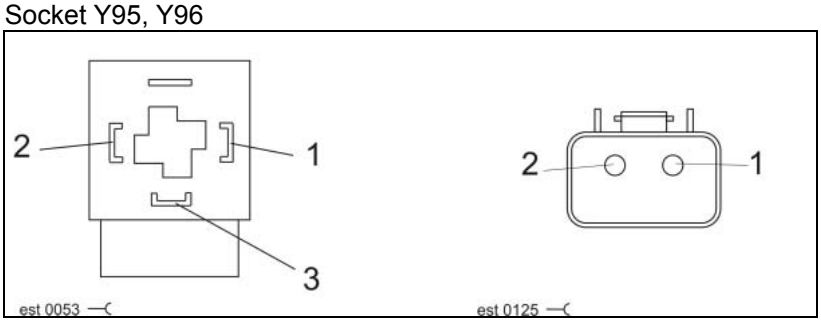
Connector XC



Socket XC



Socket Y95, Y96



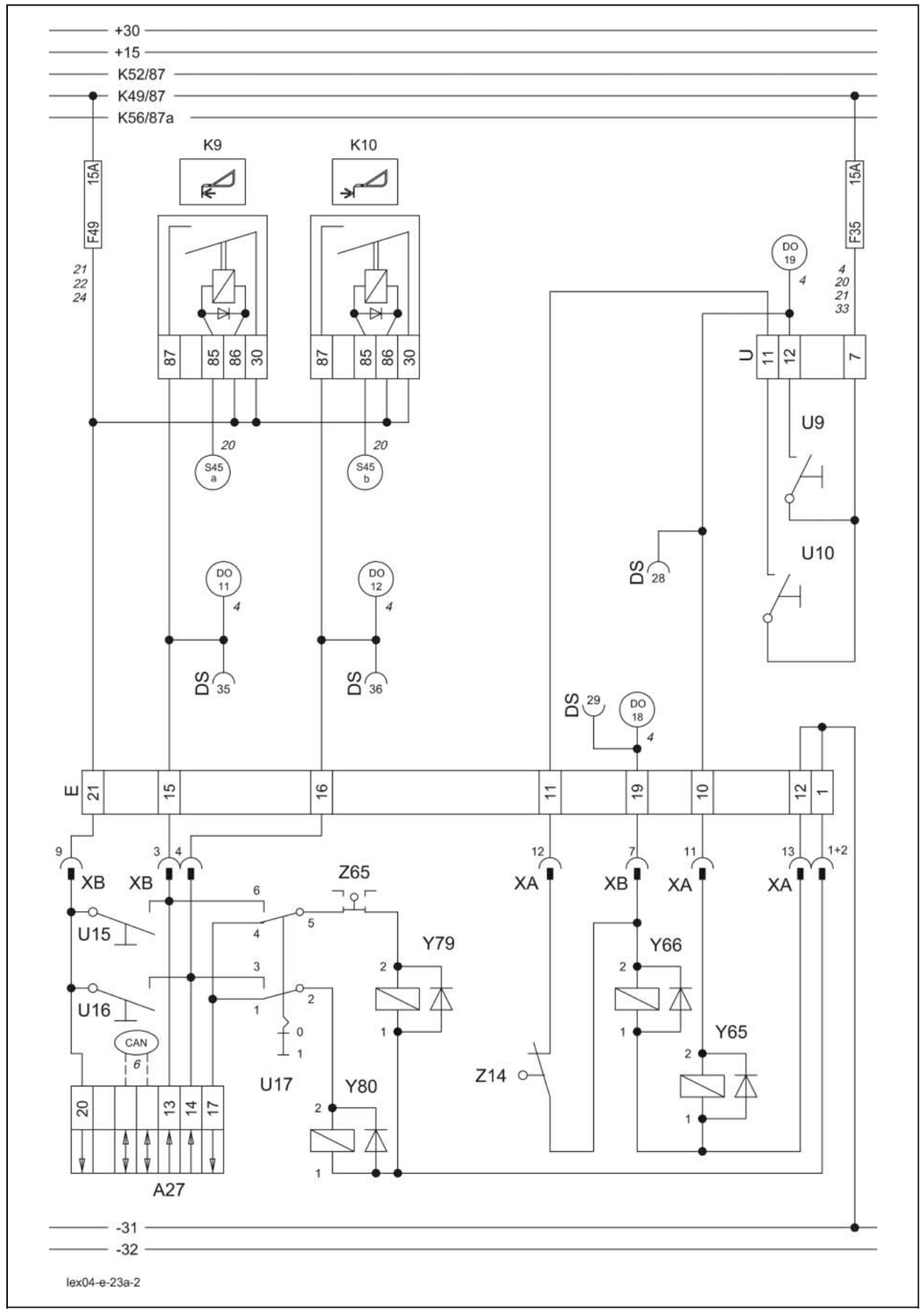
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 21	F49a	K39	K9/86	K10/30	K10/86	1.5	bk-vi
E 22	A16 5					0.75	wh-gr
E29	MA12	A16-17	B23			0.75	bl-rd
E 36	-31					1.5	br
N 11	A16 7						
Q 3	A16 22					1.0	bl-wh
Q 4	K7 87	A8 14	MQ 4	SL 11		1.0	bl-ye
Q 7	A16 13	DS 24				1.0	bk-gr
Q 8	-31					1.5	bk-ye
Q 12	A 34	B 33	BB 12	A8 2	A16 2		
	E 37	Bridge a	CB 2	Z 8			
V 11	-31					2.5	br
V 12	-31					2.5	br
XB-9						1.5	bk-vi
XB-10						1.0	wh-gr
XC-5						0.75	bl-rd
XC-12						2.5	br
XV1-1						1.0	br
XV1-2						0.75	wh-gr
XV1-5						1.0	bl

23a

Cutting table adjustment (Vario), folding the cutterbar

23a Cutting table adjustment (Vario), folding the cutterbar



Key to diagram:

		Coordinates
A27	VARIO module	8-f-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
K9	VARIO cutting table adjustment forward relay	4-i-20
K10	VARIO cutting table adjustment backward relay	4-i-20
K49	Road travel main relay	4-i-20
S45a	VARIO cutting table adjustment forward switch	4-g-17
S45b	VARIO cutting table adjustment backward switch	4-g-17
U9	Fold cutterbar to working position switch	5-h-16
U10	Fold cutterbar to transport position switch	5-h-16
U15	VARIO cutting table forward switch	7-f-21
U16	VARIO cutting table backward switch	7-f-21
U17	VARIO cutting table locking switch	7-f-21
Y65	Fold cutterbar to working position solenoid coil	8-f-20
Y66	Fold cutterbar to transport position solenoid coil	8-f-20
Y79	VARIO cutting table forward solenoid coil	8-f-20
Y80	VARIO cutting table backward solenoid coil	8-f-20
X8	Ground speed control lever connector	4-h-17
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20
XV1	AUTOCONTOUR variant plug connector	8-f-20
Z14	Reel rear end position actual value switch (folding cutterbar)	7-d-10
Z65	VARIO cutting table end position actual value switch	8-f-21

Measured value table:

Item	Component	Measured value	Remark
K 9 K10	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y65 Y66 Y79 Y80	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Cutting table adjustment

When the road travel circuit is unlocked, the switches of the external operation for the VARIO cutting table (U15/U16) and the VARIO module (A27) are supplied with power.

By operating the switches (U15/U16) the power is passed directly to the corresponding solenoid coils (Y79/Y80).
When the VARIO cutting table is operated using the multifunction handle, the solenoid coils (Y79/Y80) are actuated via the relays K9/K10.
During operation in automatic mode (VARIO automatic mode ON), the VARIO module (A27) controls the solenoid coils (Y79/Y80) according to the values programmed in the terminal (A30).

The master valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y79/Y80) because these functions require that pressure is built up in the system.

On the V-belt spring tensioner, the limit switch (Z65) avoids that the rape position is selected when the grain V-belt is installed.

Important! Any cutting table adjustment requires the switch of the cutting table lock (U17) to be in ON position.

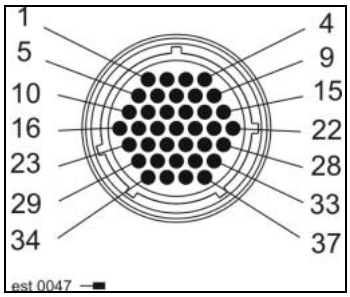
Folding the cutterbar

The cutterbar can only be folded when the limit switches (Z14) are closed. To do so, the reel must be pulled back all the way and the lock must be released.

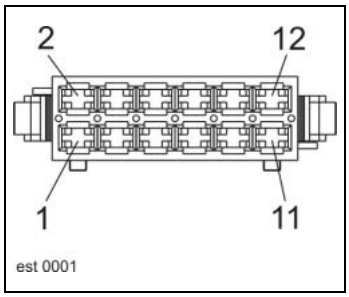
The master valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y65/Y66) because these functions require that pressure is built up in the system.

Connector pin definition:

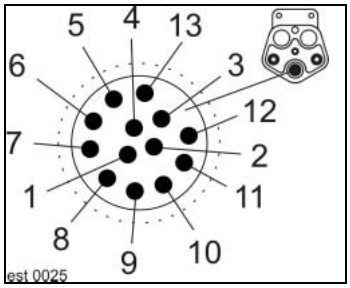
Connector E



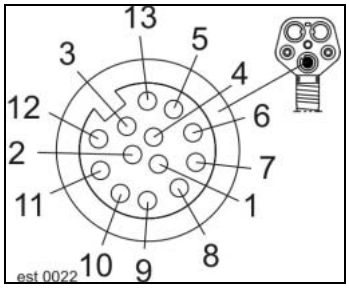
Socket U



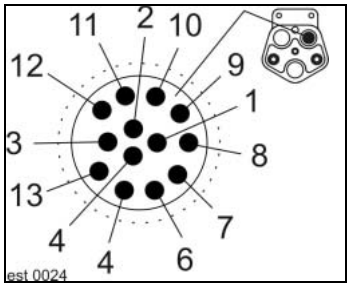
Connector XA



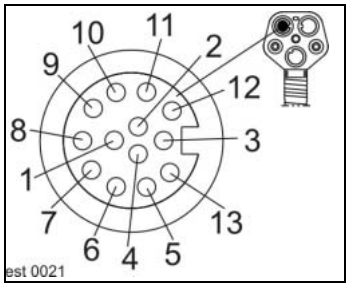
Socket XA



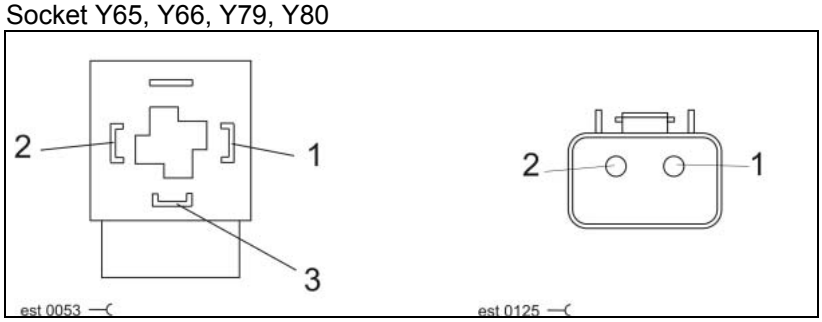
Connector XB



Socket XB



Socket Y65, Y66, Y79, Y80



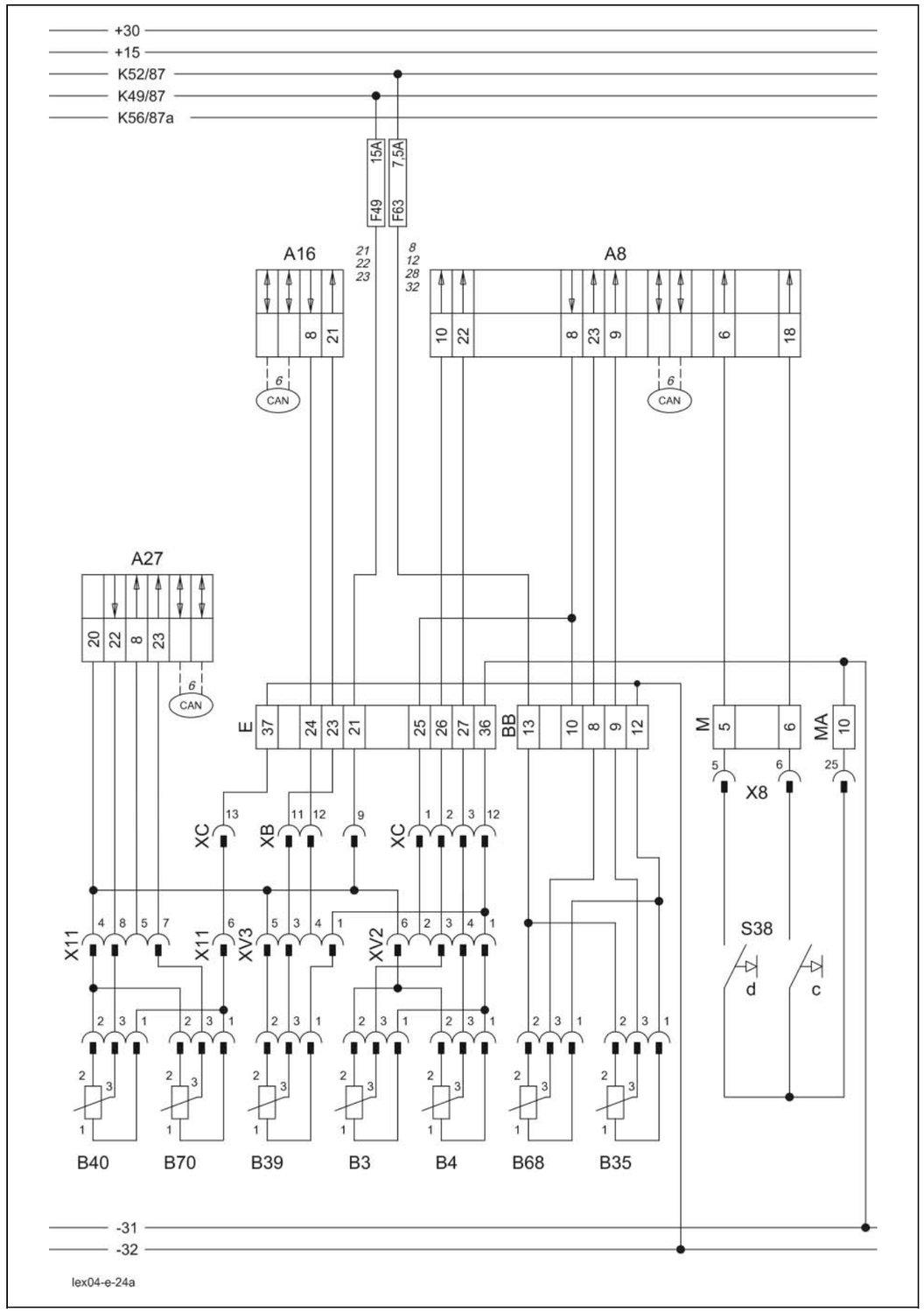
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
E 1	-31					1.5	br
E 10	U 12	1	DS 28			1.5	gn-vi
E 11	U 11					1.5	gn-ye
E 12	-31					1.5	br
E 15	K9 87	DO 11	DS 35			15	gn-br
E 16	K10 87	DO 12	DS 36			1.5	gn-bk
E 19	DO 18	DS 29				0.75	gr-br
E 21	F49 a	K9 30	K9 86	K10 30	K10 86	1.5	bl-rd
U 7	N 12	F35 a	A8 20	K5 86	K5 30	1.5	bk-br
	K6 30	K7 86	K7 30	K8 86	K8 30		
	K6 86						
U 11	E 11					1.5	vi-ye
U 12	E 10	1	DS 28			1.5	vi-gn
XA-11						1.5	gn-vi
XA-12						1.5	gn-ye
XA-13						1.5	br
XB-3						15	gn-br
XB-4						1.5	gn-bk
XB-7						0.75	gr-br
XB-9						1.5	bl-rd

24a

AUTOCONTOUR (CAC)

24a AUTOCONTOUR (CAC)



Key to diagram: Coordinates

A8	AUTOCONTOUR module (CAC)	2-i-20
A16	Reel controller module (HAS)	2-i-20
A27	VARIO module	8-f-20
B3	AUTOCONTOUR sensing band sensor, left-hand (actual value)	8-d-26
B4	AUTOCONTOUR sensing band sensor, right-hand (actual value)	8-d10
B35	Feed rake conveyor position sensor (actual value)	6-h-16
B39	Reel height position sensor (actual value)	7-e-10
B40	Reel horizontal position sensor (actual value)	7-e-10
B68	Cutterbar spring pre-tension sensor (actual value)	8-h-17
B70	VARIO cutting table position sensor (actual value)	8-f-21
S38c	CAC cutting height control multifunction pushbutton switch for front attachment	8-f-20
S38d	CAC cutting height preselection multifunction pushbutton switch for front attachment	8-f-20
X8	Ground speed control lever connector	4-h-17
X11	VARIO cutterbar sensors connector	7-f-22
XA	Multifunction coupling A connector	8-f-20
XB	Multifunction coupling B connector	8-f-20
XC	Multifunction coupling C connector	8-f-20
XV1	AUTOCONTOUR variant plug connector	8-f-20
XV3	Reel functions variant plug connector	8-f-20

Circuit diagram layout

Circuit diagram 24a includes the complete sensor equipment required for the AUTO-CONTOUR system. The control of the individual functions is explained in the following circuit diagrams below:

20a - Front attachment raise/lower, cross levelling
21a - Reel adjustment - Standard cutterbar
21b - Reel adjustment - VARIO cutterbar
21c - Reel adjustment - Folding cutterbar
22a - Reel variable-speed drive
23a - Cutterbar table adjustment (Vario)

Measured value table:

Item	Component	Measured value	Remark
B 3	Sensor	12 V	(Pin 1-2)
B 4		0.25 V – 4.75 V	(Pin 1-3)
B35			
B39			
B40			
B68			
B70			

Description of function:

AUTOCONTOUR System (CAC)

The AUTOCONTOUR (CAC) function includes automatic cutterbar guiding, reel control and cutting table adjustment (VARIO), depending on the respective machine equipment.

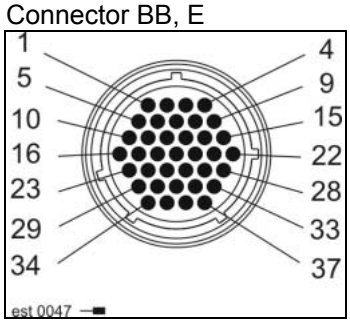
The pushbuttons (S38c/d) activate the function cutting height preselection or cutting height control in the AUTOCONTOUR module (A8). Now the relevant solenoid coils of the individual functions are actuated by the modules A8, A16 and A27 until the actual values of the respective sensors agree with the setpoints.

Influence on control system

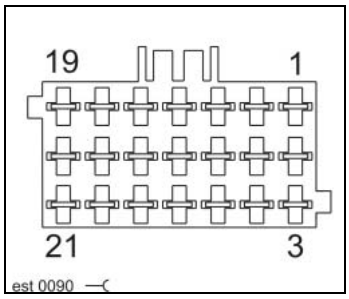
- Setting of drop rate (Hydraulic system, chapter 3.2)
- Setting of spring pre-stress (Hydraulic system, chapter 3.2)
- Setting of CAC sensitivity (Terminal A30 = Cebis)
- Learning of limit stops (Terminal A30 = Cebis)
- Storing the work positions (Terminal A30 = Cebis)

Connector pin definition:

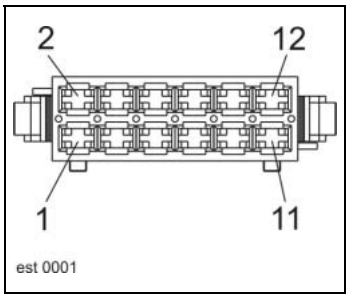
Connector BB, E



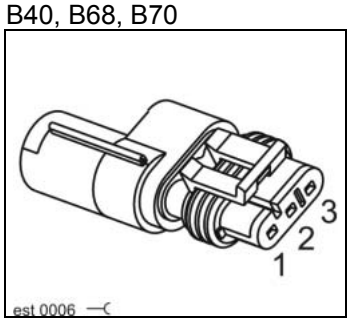
Socket M



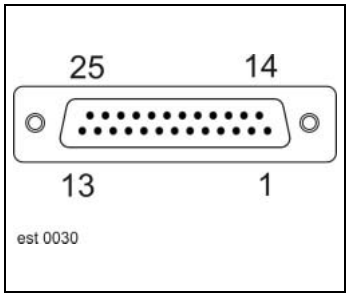
Socket MA



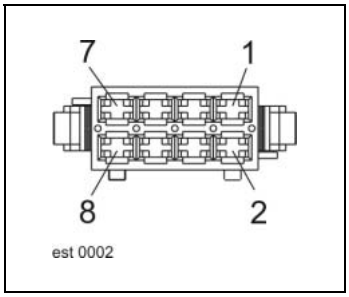
Socket B3, B4, B35, B39, B40, B68, B70



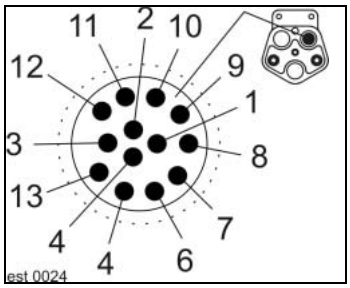
Socket X8



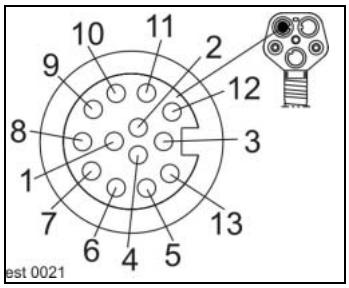
Socket X11



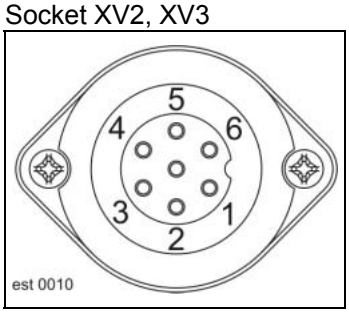
Connector XB



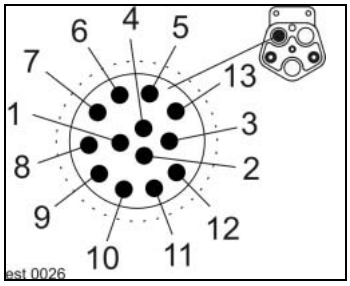
Socket XB



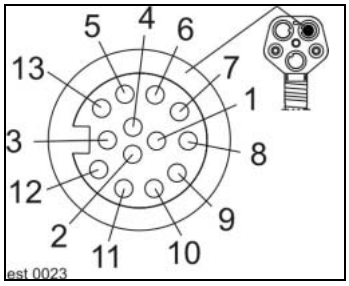
Socket XV2, XV3



Connector XC



Socket XC



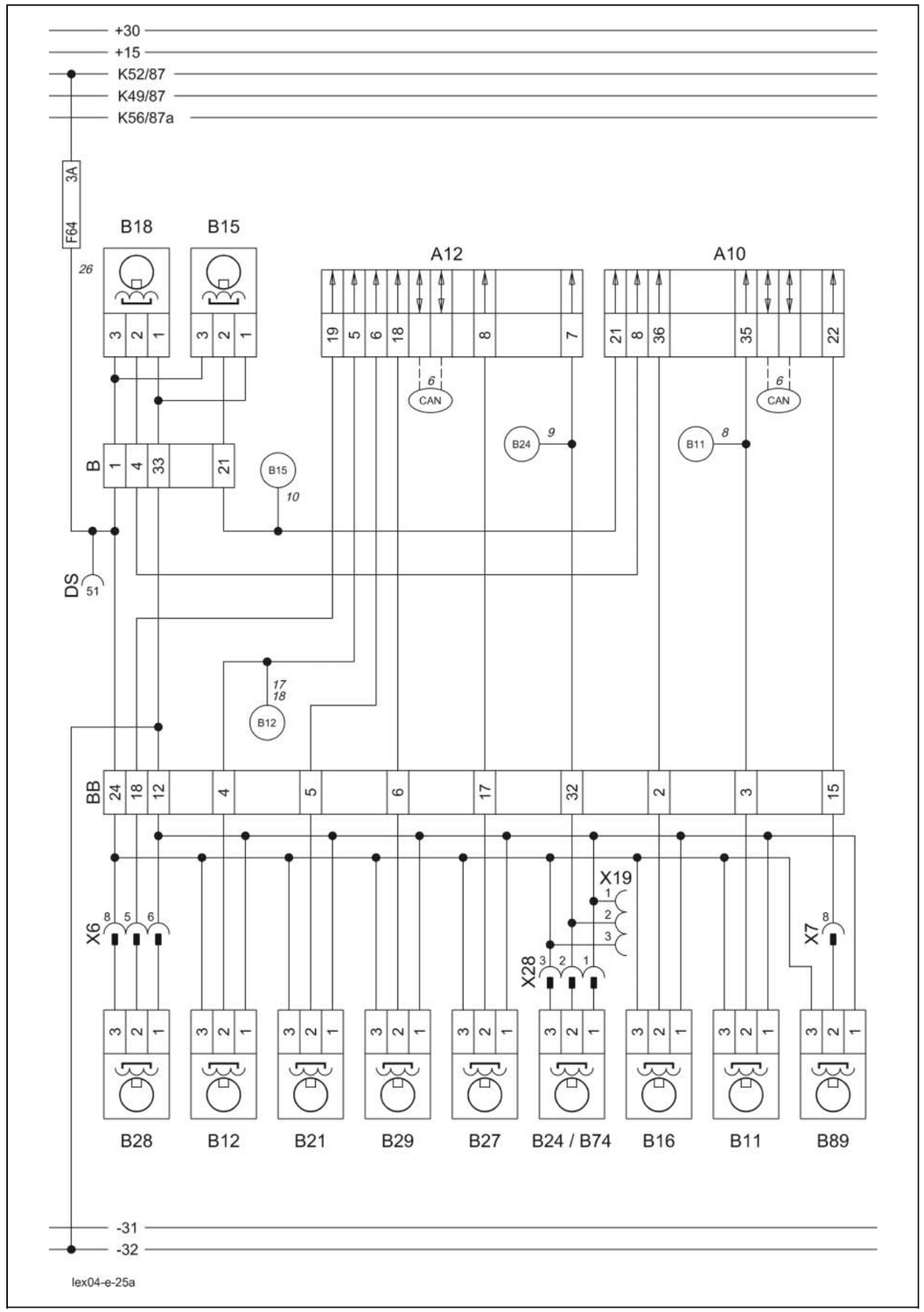
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
BB 8	A8 23					1.0	gr-rd
BB 9	A8 9					1.0	gn-vi
BB10	A8 8	E 25	B 31	DS 48			
BB12	A 34	B 33	Q 12	A8 2	A16 2	1.5	bl
	E 37	Bridge a	CB 2	Z 8			
BB 13	MR 5	B 30	MU 8	DS 57	F63 a	1.0	rd-gr
E 1	-31					1.5	br
E 12	-31					1.5	br
E21						1.5	bl
E 23	A16 21					0.75	wh-vi
E 24	A16 8					0.75	rd-wh
E 25	A8 8	BB 10	B 31	DS 48		0.75	rd-ye
E 26	A8 10					0.75	or-wh
E 27	A8 22					0.75	or-ye
E 36	-31					1.5	br
E37							
M 5	A8 6					0.5	ye-gr
M 6	A8 18					0.5	ye-rd
MA 10	-31					1.5	br
X8-5						0.5	vi-rd
X8-6						0.5	vi-bk
X8-25						1.5	br
X11-4						1.5	gn
X11-5							
X11-6						1.5	br
X11-7						1.5	ye-rd
X11-8						1.5	wh-gn
XB-9						0.75	bl
XB-11						0.75	wh-vi
XB-12						0.75	rd-wh
XC-1						0.75	rd-ye
XC-2						0.75	or-wh
XC-3						0.75	or-ye
XC-12						1.0	br
XC-13						1.0	bl-br
XV2-1						0.75	br
XV2-2						0.75	rd-ye
XV2-3						0.75	or-wh
XV2-4						0.75	or-ye
XV2-6						0.75	rd-ye
XV3-1						1.0	br
XV3-3						0.75	wh-vi
XV3-4						0.75	rd-wh
XV3-5						0.75	bl

25a

Speed monitor

25a Speed monitor



Key to diagram:

		Coordinates
A10	Fieldwork computer module (BIF/CAB)	2-i-20
A12	Speed monitor module (DZW)	2-i-20
B11	Threshing drum speed sensor	6-i-16
B12	Feed rake conveyor speed sensor	6-h-16
B15	Fan speed sensor	7-i-16
B16	Gearbox speed sensor (ground speed)	7-i-18
B18	Main drive speed sensor	4-m-20
B21	Grain elevator speed sensor	3-m-16
B24	Rotor speed sensor	3-t-16
B27	Chaff spreader speed sensor	7-s-17
B28	Straw chopper speed sensor (uni-spreader)	7-t-17
B29	Returns speed sensor	4-i-16
B74	Finger roller speed sensor	4-m-16
B89	Radial spreader speed sensor	6-u-18
DS	Diagnosis plug (63-pin) VIA	3-i-20
K52	Power supply relay	4-i-20
X6	Straw chopper connector	5-t-16
X7	Connector Deflector adjustment / Uni-spreader	5-s-17
X19	Finger roller connector	4-m-16
X28	Rotor connector	3-t-16

Measured value table:

Item	Component	Measured value	Remark
B11 B12 B15 B16 B18 B21 B24 B27 B28 B29 B74 B89	Sensor digital (0-I)	12 V 0.4 V – 4.6 V	Power supply (Pin 1-3) Signal (Pin 1-2) 0.4 V = LED dark = 0 4.6 V = LED bright = I

Description of function:

Diesel engine	2,100 - 2,200 rpm
Main shaft	1,400 rpm
Feeder housing without variable-speed drive with variable-speed drive	425 rpm 285 - 425 rpm
Threshing drum without reduction gearbox with reduction gearbox	395 - 1,150 rpm 160 - 480 rpm
Returns elevator	400 rpm
Grain elevator	350 rpm
Fan Lexion 580-520 Lexion 510	700 - 1,600 rpm 480 - 1,070 rpm
Intensive separation system, front (Lexion 560-510)	140 rpm
Intensive separation system, rear (Lexion 560-510)	140 rpm
Finger roller	120 rpm
Straw walker (Lexion 560-510)	240 rpm
Rotors (Lexion 580/570) Variator Step drive 1st step standard 2nd step standard 3rd step standard 4th step for maize	 360 - 1,050 rpm* 960 rpm 800 rpm 640 rpm 500 rpm
Straw chopper (Lexion 560-510) Grain Maize	3,310 rpm 1,950 rpm
Chaff spreader	550 - 850 rpm
Straw spreader without reduction gearbox with reduction gearbox	420 - 1,230 rpm 180 - 560 rpm
Uni-spreader (Lexion 580) Grain Maize	1,750 rpm 900 rpm

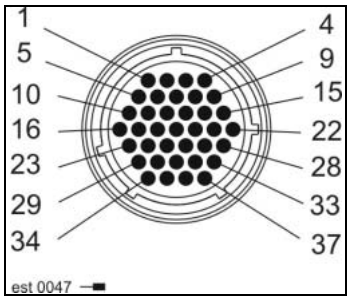
* Important: There are different input speeds of the rotor gearboxes, depending on the version. This must also be considered in the machine configuration using the CLAAS diagnosis system.
- CLAAS transmission ratio: 1:2.14
- Röchling transmission ratio: 1:2.59

Speed monitor

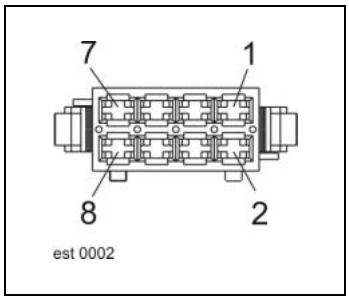
The frequencies of the individual sensors are converted into a digital signal by the fieldwork computer (A10) or speed monitor (A12) modules and then displayed through the CAN bus on the terminal (A30). If admissible slippage limits are exceeded, a corresponding alarm message is also displayed.

Connector pin definition:

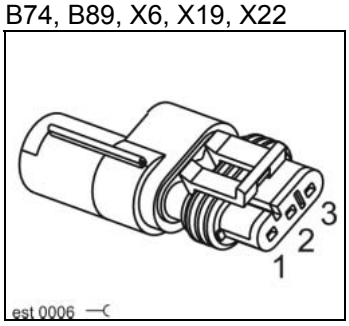
Connector B, BB



Socket X6.X7



Socket
B11, B12, B15, B16, B18, B21, B24, B27, B28, B29, B74, B89, X6, X19, X22



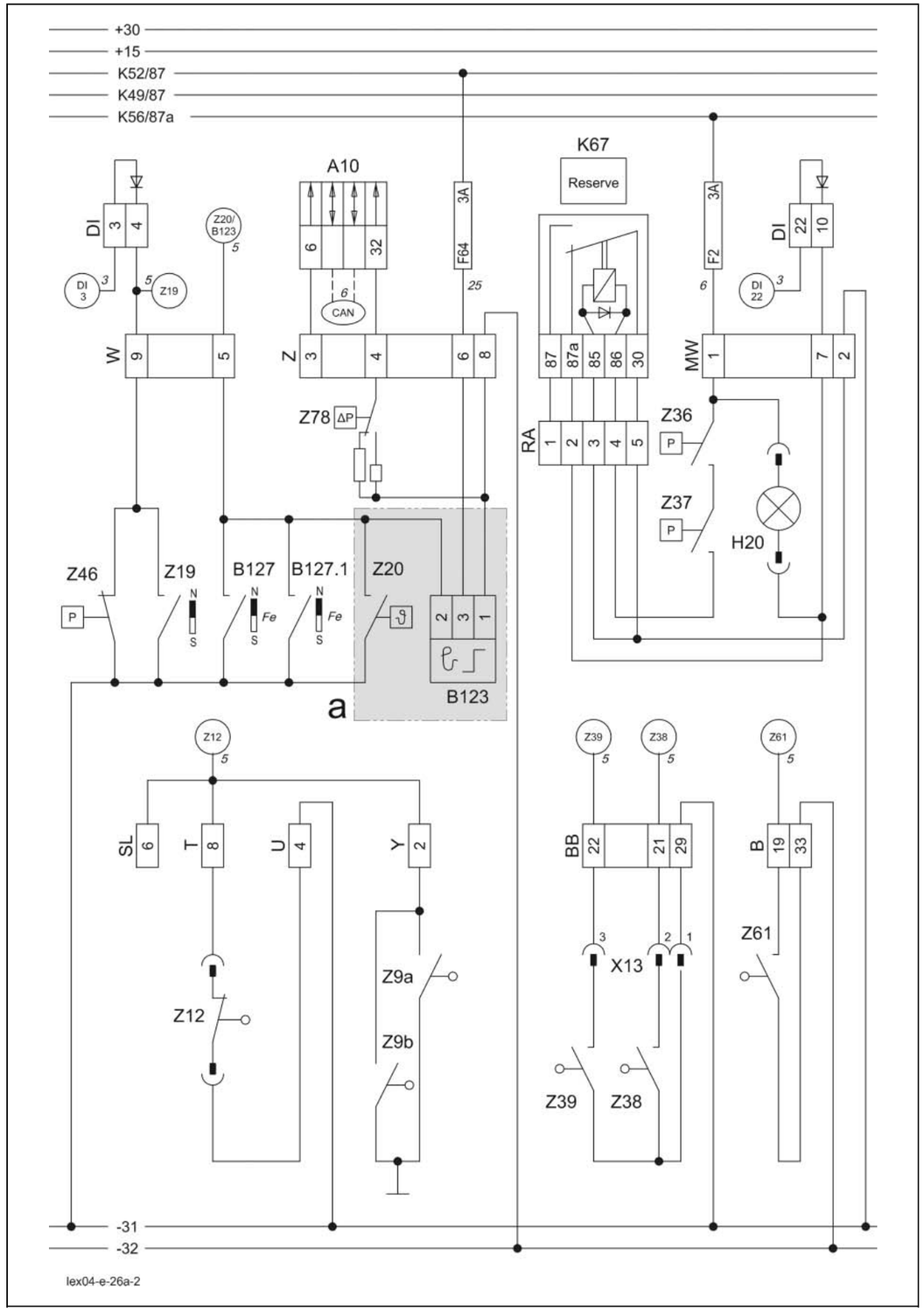
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 1	F64 a	BB 24	DS 51	Z 6		1.0	wh-ye
B 4	A10 8					1.0	wh-vi
B 21	A10 21					1.0	wh-or
B 33	A 34	BB 12	A8 2	A16 2	Q 12	1.0	pi-bl
	E 37	Bridge a	CB 2	Z 8			
BB 2	A10 36					1.0	wh-br
BB 3	A10 35					1.0	wh
BB 4	A12 5					1.0	wh
BB 5	A12 6					1.0	rd-wh
BB 6	A12 18					1.0	ye-gn
BB 12	A 34	B 33	A8 2	A16 2	Q 12	1.5	bl
	E 37	Bridge a	CB 2	Z 8			
BB 15	A10 22					1.0	ye-gr
BB 17						0.75	ye-wh
BB 18	A12 19					1.0	bl-rd
BB 24	F64 a	B 1	DS 51	Z 6		1.0	ye-bl
X6-5						1.0	bl-rd
X6-6						1.5	br-bl
X6-8						1.0	ye-bl

26a

Machine monitor

26a Machine monitor



Key to diagram:

Coordinates

B123	Hydraulic oil temperature sensor	3-p-19
B127	Ground drive hydraulics metal detector sensor	7-q-18
DI	Warning device diode PCB	4-i-20
H20	Rubber track tension signal light	3-h-17
X13	3D / rear axle connector	6-p-16
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
K67	Spare relay (rubber track tension)	4-i-20
Z9a	Brake lining wear actual value switch	7-j-18
Z9b	Brake lining wear actual value switch	7-j-18
Z12	Parking brake actual value switch	5-g-19
Z19	Hydraulic oil level actual value switch (min.)	3-p-19
Z20	Hydraulic oil temperature actual value switch	3-p-19
Z36	Left rubber track tension actual value switch	7-i-21
Z37	Right rubber track tension actual value switch	7-i-16
Z38	Left steering position actual value switch	7-q-20
Z39	Right steering position actual value switch	7-q-16
Z46	Low-pressure hydraulics/ground drive oil pressure actual value switch	3-p-19
Z61	Straw jam warning actual value switch	3-s-18
Z78	Ground drive filter actual value switch	3-o-19
a	- Switch or sensor, depending on equipment fitted	

Note: The rubber track tension actual value switches (Z36/Z37) are shown in their unactuated state.
If the rubber track tension is correct, both switches are closed and therefore relay K67 is actuated when the machine is running.

Measured value table:

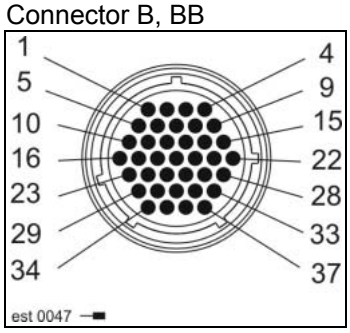
Item	Component	Measured value	Remark
B123	Sensor	12 V Signal = Earth	(Pin 1-3) (Pin 2)
Z78	Pressure switch	> 1250 Ω < 500 Ω	Not actuated Actuated

Description of function:

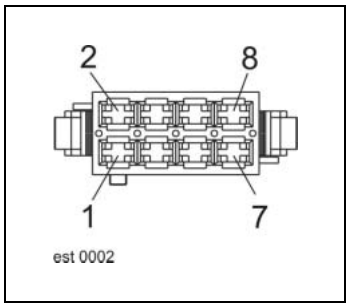
Hydraulic oil level warning (min.)	If the diesel engine is not started, the terminal (A30) recognizes an earth signal on pin 15 as the signal of the float switch (Z19) and displays the filling level alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Low-pressure hydraulics/ground drive oil pressure warning	If the diesel engine is started, the terminal (A30) recognizes an earth signal on pin 15 as the signal of the oil pressure switch (Z46) and displays the oil pressure alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Hydraulic oil temperature warning	The earth signal from the hydraulic oil temperature switch/sensor (Z20/B123) is connected to terminal (A30) and displayed as an alarm message (see Ground drive hydraulics metal detector warning).
Ground drive hydraulics metal detector warning	**Important:** The ground drive hydraulics metal detector sensors (B127) may be installed in parallel with the temperature switch (Z20) (option). Consequently, the hydraulic oil temperature warning may also be released by the ground drive hydraulics metal detector sensors (B127).
Parking brake / brake lining monitor warning	The earth signal of the parking brake switch (Z12) or brake lining monitor (Z9a/b) is sent to the terminal (A30) and displayed as an alarm message. In the diagram, the state of the switch (Z12) is shown with the parking brake applied.
Straw jam warning	The earth signal of switch (Z61) is sent to the terminal (A30) and displayed as an alarm message.
Half-tracks steering position display	For machines with half-tracks, the connector X13 is connected with the microswitches (Z38/Z39) on the steering axle.
Half-tracks tension	If the oil pressure in one of the tensioning systems falls below 160 bar, the earth signal of the corresponding oil pressure switch (Z36/Z37) is sent to the indicator light (H20) and at the same time to the pulse generator via the diode PCB (DI).
Hydraulic filter warning	The "Hydraulic filter plugged" alarm is released when switch (Z78) is closed for more than 5 seconds (engine temperature > 60°C).

Connector pin definition:

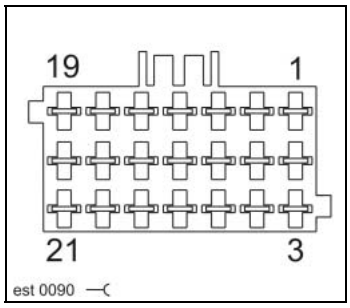
Connector B, BB



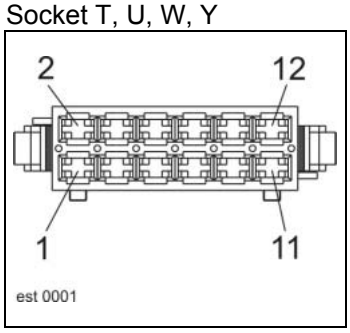
Socket MW



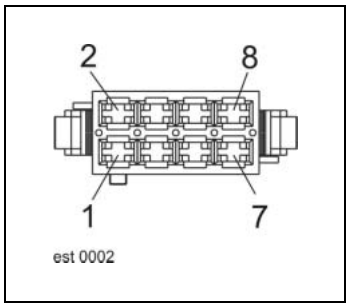
Socket SL



Socket T, U, W, Y



Socket Z



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 19	A 7					1.0	bk-gr
B 33	A 34	BB 12	A8 2	A16 2	Q 12	1.0	pi-bl
	E 37	Bridge a	CB 2	Z 8			
BB 21	A 3					1.0	or-bk
BB 22	A 2					1.0	or-rd
BB 29	-31					1.5	br
MW 1	F02 a	MV 1	A25 15				
MW 2	-31						
MW 5	F56 a						
MW 7	DI 10						
SL 6	A 11	T 8	Y 2				
T 8	A 11	Y 2	SL 6			0.75	br-wh
U 4	-31					2.5	br
W 5	A 16					1.0	br-wh
W 9	A 15	DI 4				1.0	gn-rd
Y 2	A 11	T 8	SL 6			0.75	br-rd
Z 3	A10 6					1.0	rd-bk
Z 4	A10 32					1.0	gn-wh
Z 6	F64 a	B 1	BB 24	DS 51		1.0	gn-bl
Z 8	A 34	B 33	BB 12	A8 2	A16 2	1.0	rd-wh
	Q 12	E 37	Bridge a	CB 2			
X13-1						1.0	br
X13-2						1.0	or-bk
X13-3						1.0	or-rd

26s

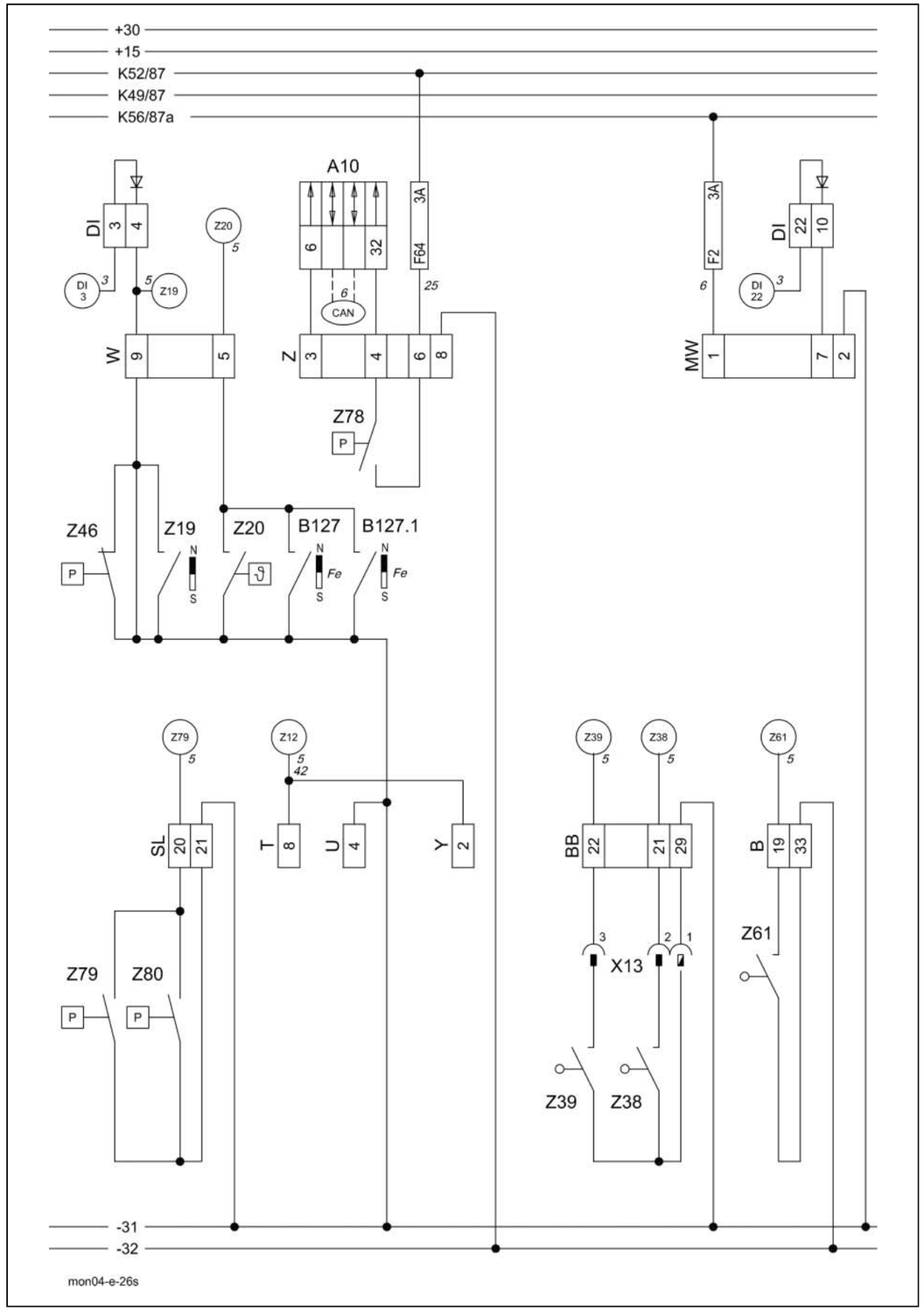
Machine monitor

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

26s Machine monitor, Montana 570-520 - with external MONTANA control unit
(up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram: Coordinates

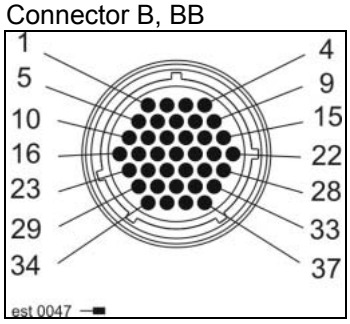
A10	Fieldwork computer module (BIF/CAB)	2-i-20
B127	Ground drive hydraulics metal detector sensor	7-q-18
DI	Warning device diode PCB	4-i-20
K52	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
X13	3D / rear axle connector	6-p-16
Z19	Hydraulic oil level actual value switch (min.)	3-p-19
Z20	Hydraulic oil temperature actual value switch	3-p-19
Z38	Left steering position actual value switch	7-q-20
Z39	Right steering position actual value switch	7-q-16
Z46	Low-pressure hydraulics/ground drive oil pressure actual value switch	3-p-19
Z61	Straw jam warning actual value switch	3-s-18
Z78	Ground drive filter actual value switch	3-o-19
Z79	Left brake circuit pressure switch	5-g-20
Z80	Right brake circuit pressure switch	5-g-20

Description of function:

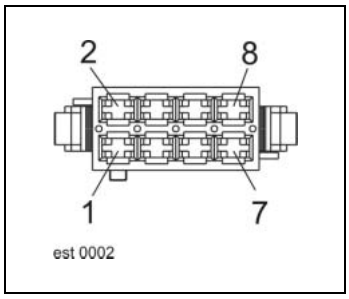
Hydraulic oil level warning (min.)	If the diesel engine is not started, the terminal (A30) recognizes an earth signal from the hydraulic oil level float switch (Z19) on pin 15 and displays the filling level alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Low-pressure hydraulics / Ground drive oil pressure warning	If the diesel engine is started, the terminal (A30) recognizes an earth signal from the oil pressure switch (Z46) on pin 15 and displays the oil pressure alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Hydraulic oil temperature warning	The earth signal of the hydraulic oil temperature switch (Z20) is connected to terminal (A30) and displayed as an alarm message (see Ground drive hydraulics metal detector warning).
Ground drive hydraulics metal detector warning	**Important!** The ground drive hydraulics metal detector sensors (B127) may be installed in parallel with the temperature switch (Z20) (option). Thus the hydraulic oil temperature warning can also be released by the ground drive hydraulics metal detector sensors (B127).
Montana brake oil pressure warning	The earth signal of the left / right brake circuit pressure switch (Z79/Z80) is connected to the terminal (A30) and displayed as an alarm message.
Straw jam warning	The earth signal of switch (Z61) is sent to the terminal (A30) and displayed as an alarm message.
Half-tracks steering position display	On machines equipped with half-tracks, connector X13 is connected with the microswitches (Z38/Z39) on the rear axle.
Hydraulic filter warning	The "Hydraulic filter plugged" alarm is released when switch (Z78) is closed for more than 5 seconds (engine temperature > 60°C).

Connector pin definition:

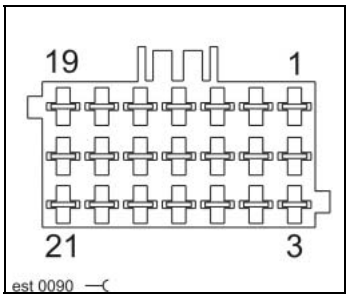
Connector B, BB



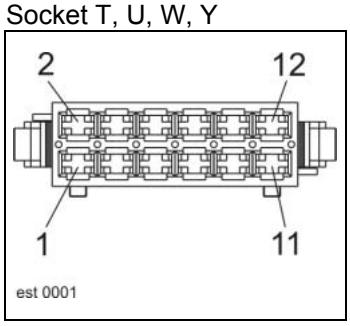
Socket MW



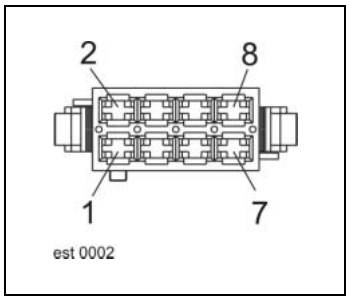
Socket SL



Socket T, U, W, Y



Socket Z



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 19	A 7					1.0	bk-gr
B 33	A 34	BB 12	A8 2	A16 2	Q 12	1.0	pi-bl
	E 37	Bridge a	CB 2	Z 8			
BB 21	A 3					1.0	or-bk
BB 22	A 2					1.0	or-rd
BB 29	-31					1.5	br
MW 1	F02 a	MV 1	A25 15				
MW 2	-31						
MW 5	F56 a						
MW 7	DI 10						
SL 6	A 11	T 8	Y 2				
T 8	A 11	Y 2	SL 6			0.75	br-wh
U 4	-31					2.5	br
W 5	A 16					1.0	br-wh
W 9	A 15	DI 4				1.0	gn-rd
Y 2	A 11	T 8	SL 6			0.75	br-rd
Z 3	A10 6					1.0	rd-bk
Z 4	A10 32					1.0	gn-wh
Z 6	F64 a	B 1	BB 24	DS 51		1.0	gn-bl
Z 8	A 34	B 33	BB 12	A8 2	A16 2	1.0	rd-wh
	Q 12	E 37	Bridge a	CB 2			
X13-1						1.0	br
X13-2						1.0	or-bk
X13-3						1.0	or-rd

26t

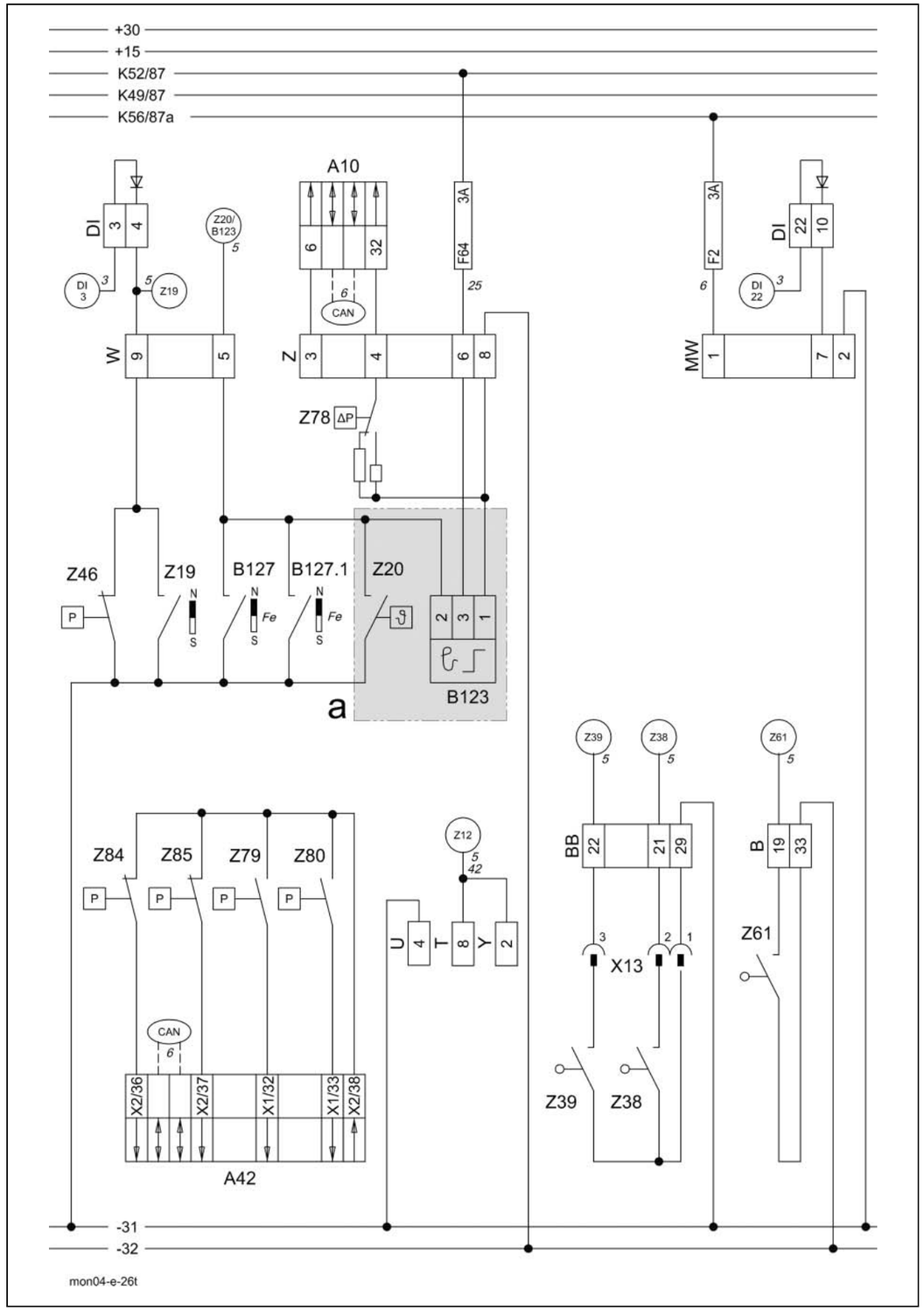
Machine monitor

Montana 570-520

- with integrated MONTANA control unit

- from serial no. 581 00027 to 581 00037

26t Machine monitor, Montana 570-520 - with integrated MONTANA control unit
(from serial no. 581 00027 to 581 00037)



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A42	MONTANA GEN II module	3-h-17
B123	Hydraulic oil temperature sensor	3-p-19
B127	Ground drive hydraulics metal detector sensor	7-q-18
DI	Warning device diode PCB	4-i-20
K52	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
X13	3D / rear axle connector	6-p-16
Z19	Hydraulic oil level actual value switch (min.)	3-p-19
Z20	Hydraulic oil temperature actual value switch	3-p-19
Z38	Left steering position actual value switch	7-q-20
Z39	Right steering position actual value switch	7-q-16
Z46	Low-pressure hydraulics/ground drive oil pressure actual value switch	3-p-19
Z61	Straw jam warning actual value switch	3-s-18
Z78	Ground drive filter actual value switch	3-o-19
Z79	Left brake circuit pressure switch	5-g-20
Z80	Right brake circuit pressure switch	5-g-20
Z84	Left brake pedal actual value switch	5-f-20
Z85	Right brake pedal actual value switch	5-f-20
a	- Switch or sensor, depending on equipment fitted	

Measured value table:

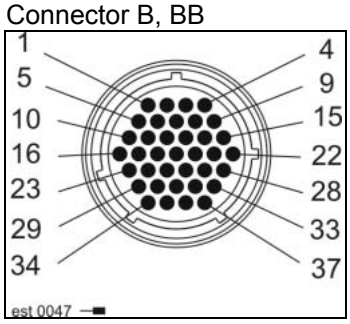
Item	Component	Measured value	Remark
B123	Sensor	12 V Signal = Earth	(Pin 1-3) (Pin 2)
Z78	Pressure switch	> 1250Ω < 500Ω	Not actuated Actuated
Z79 Z80	Pressure switch 115 bar	Approx. 6V (U_{Bat}/2) (at module input)	NC contact, 50% PWM (T signal)
Z84 Z85	Pressure switch 25 bar	Approx. 6V (U_{Bat}/2) (at module input)	NO contact, 50% PWM (T signal)

Description of function:

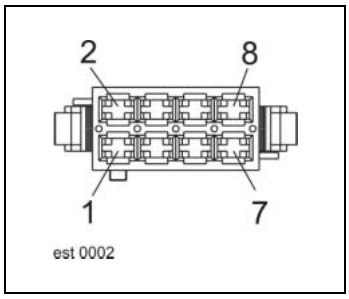
Hydraulic oil level warning (min.)	If the diesel engine is not started, the terminal (A30) recognizes an earth signal from the hydraulic oil level float switch (Z19) on pin 15 and displays the filling level alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Low-pressure hydraulics / Ground drive oil pressure warning	If the diesel engine is started, the terminal (A30) recognizes an earth signal from the oil pressure switch (Z46) on pin 15 and displays the oil pressure alarm message. At the same time, the earth signal is sent to the pulse generator K57 through the diode PCB (DI).
Hydraulic oil temperature warning	The earth signal from the hydraulic oil temperature switch/sensor (Z20/B123) is connected to terminal (A30) and displayed as an alarm message (see Ground drive hydraulics metal detector warning).
Ground drive hydraulics metal detector warning	**Important!** The ground drive hydraulics metal detector sensors (B127) may be installed in parallel with the temperature switch (Z20) (option). Thus the hydraulic oil temperature warning can also be released by the ground drive hydraulics metal detector sensors (B127).
Montana brake oil pressure warning	At a pressure below 115 bar, the voltage signal from the left / right brake circuit pressure switches (Z79/Z80) is connected to the terminal (A30) and displayed as an alarm message. Reloading the brake circuit is controlled via the brake circuit charge pressure sensor (B90) – see circuit diagram 41t.
Straw jam warning	The earth signal of switch (Z61) is sent to the terminal (A30) and displayed as an alarm message.
Half-tracks steering position display	On machines equipped with half-tracks, connector X13 is connected with the microswitches (Z38/Z39) on the rear axle.
Hydraulic filter warning	The "Hydraulic filter plugged" alarm is released when switch (Z78) is closed for more than 5 seconds (engine temperature > 60°C).
Service brake	Pressing both brake pedals (Z84/Z85) is a pre-condition for shifting the gears in the manual gearbox. To guarantee that the machine is standing still, a brake pressure of 25 bar min. must be built up by the force acting on the pedal. At the same time, the control oil pressure necessary for the ground drive is relieved – see circuit diagram 41t.
Parking brake	When actuating the parking brake (S93), the control oil pressure necessary for the ground drive is relieved – see circuit diagram 41t.

Connector pin definition:

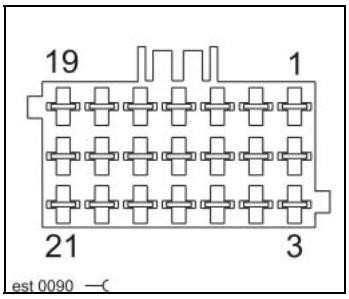
Connector B, BB



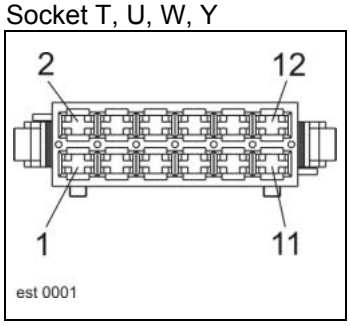
Socket MW



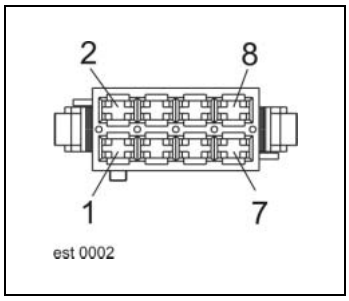
Socket SL



Socket T, U, W, Y



Socket Z



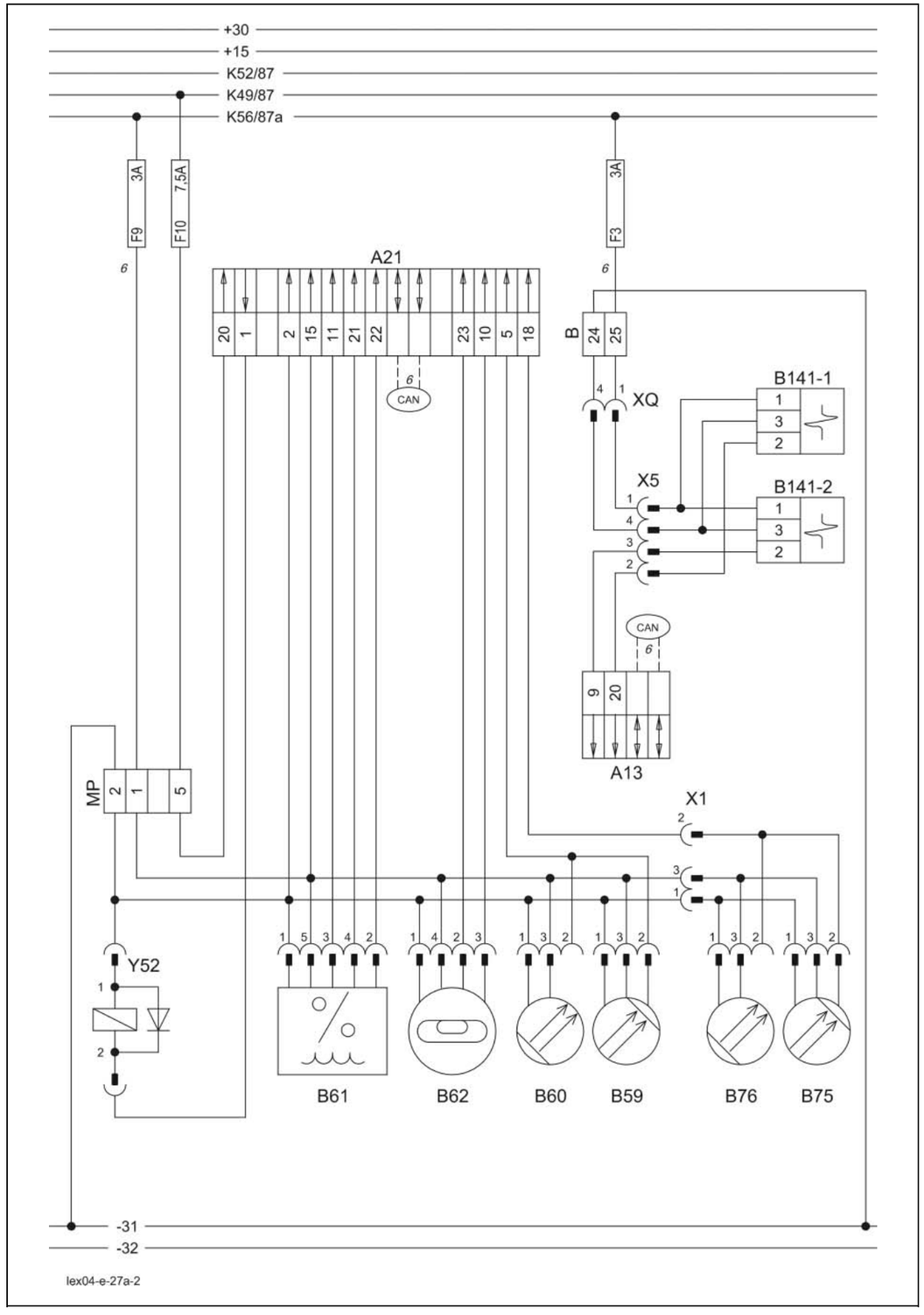
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A42-X1/32						1.0	bl-wh
A42-X1/33						1.0	bk-br
A42-X2/36						1.0	bk-gr
A42-X2/37						1.0	bk-wh
A42-X2/38						1.0	wh-bl
						1.0	
B 19	A 7					1.0	bk-gr
B 33	A 34	BB 12	A8 2	A16 2	Q 12	1.0	pi-bl
	E 37	Bridge a	CB 2	Z 8			
BB 21	A 3					1.0	or-bk
BB 22	A 2					1.0	or-rd
BB 29	-31					1.5	br
T 8	A 11	Y 2	SL 6			0.75	br-wh
U 4	-31					2.5	br
W 5	A 16					1.0	br-wh
W 9	A 15	DI 4				1.0	gn-rd
Y 2	A 11	T 8	SL 6			0.75	br-rd
Z 3	A10 6					1.0	rd-bk
Z 4	A10 32					1.0	gn-wh
Z 6	F64 a	B 1	BB 24	DS 51		1.0	gn-bl
Z 8	A 34	B 33	BB 12	A8 2	A16 2	1.0	rd-wh
	Q 12	E 37	Bridge a	CB 2			
X13-1						1.0	br
X13-2						1.0	or-bk
X13-3						1.0	or-rd

27a

Yield meter / Grainmeter

27a Yield meter / Grainmeter



Key to diagram:

Coordinates

A13	Performance monitor module (DKG)	4-p-20
A21	YIELD METER module (LEM)	2-i-20
B141-1	Grain portion in left returns	7-q-19
B141-2	Grain portion in right returns	7-q-17
B59	YIELD METER (LEM) receiver sensor	4-m-16
B60	YIELD METER (LEM) transmitter sensor	4-m-16
B61	YIELD METER grain humidity sensor	5-m-16
B62	YIELD METER inclination sensor	7-i-18
B75	Returns control (LEM) receiver sensor	5-j-16
B76	Returns control (LEM) transmitter sensor	5-j-16
K49	Road travel main relay	4-i-20
K56	Electronic unit plus relay	4-i-20
X5	Connector	5-q-20
Y52	YIELD METER sample slide solenoid coil	5-m-16

Measured value table:

Item	Component	Measured value	Remark
B59 B75	Receiver	> 2.5 V ~ 1.2 V	with light incidence with shading
B60 B76	Transmitter	12 V	Transmits infrared light
B61	Humidity sensor	7 V	Reference voltage (pin 4)
B141	Sensor	4 V	Basic signal
B62	Inclination sensor	30°- 0°- 30° 1.2 - 3.0 - 4.8 V	Conductive liquid
Y52	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Yield measuring

The yield measuring is based on flow rate measurement by the light barrier (B59/B60) inside the grain elevator, depending on transverse and longitudinal inclination of the machine. Based on these signals, the yield meter module (A21) calculates the yield and displays this information in terminal A30 via the CAN bus.
System calibration by entering the litre weight and by checking the values by counterweighing a defined grain quantity constitute important fundamentals for a precise calculation.

Important! All yield data is saved in the yield meter module (A21). It is therefore recommended to save these data using the Claas Diagnosis System CDS prior to replacing a defective module and to transmit them to the new module.

Moisture measurement

The measurements made by the moisture sensor (B61) are also displayed by the yield meter module (A21) in terminal A30 via the CAN bus, but are not used for calculating the gross weight. Terminal A30 requires these measured values for calculation only for stating the net weight in order processing.
The yield meter module (A21) controls the measurement intervals depending on the yield by using the sample slide (Y52). The time between individual measurements is reduced linearly from approx. 2 min at 3 t/h to approx. 15 s at 50 t/h.
In order to empty and clean the measuring chamber, the sample slide (Y52) must be actuated once when turning off the threshing mechanism.

Returns measurement

The returns measurement is based on flow rate measurement by the light barrier (B75/B76) inside the grain elevator, depending on transverse and longitudinal inclination of the machine. Based on these signals, the yield meter module (A21) calculates the returns quantity and displays this information in terminal A30 via the CAN bus.

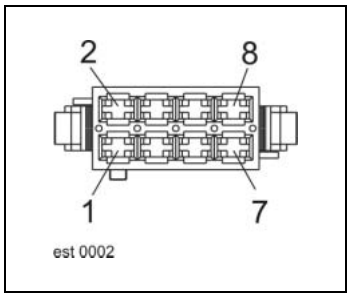
Measuring the grain portion in the returns (grainmeter)

The signals from the individual sensors (B141-1/141-2) are transmitted to the performance monitor module (A13). The sensitivity is adjusted in the CEBIS terminal (A30). In this process, the adjustment is linked to that of the „Residual separation” sensors.

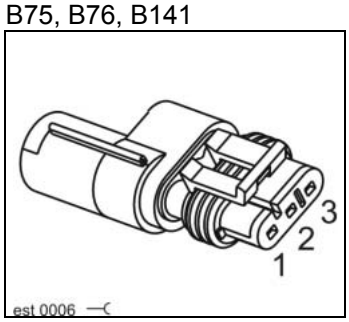
The sensors can be checked using the CEBIS terminal (A30), menu "Adjustments – Separation – Sensor test".

Connector pin definition:

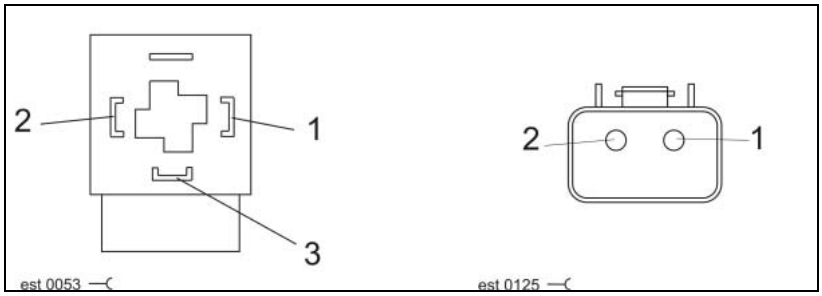
Socket MP



Socket B59, B60, B61, B62, B75, B76, B141



Socket Y52



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
MP 1	F09 a						
MP 2	-31						
MP 5	F10 a						
B59-1						0.75	br
B59-2						0.75	bk-br
B59-3						0.75	bk-bl
B60-1						0.75	br
B60-2						0.75	bk-br
B60-3						0.75	bk-bl
B61-1						0.75	br
B61-2						0.75	bl-or
B61-3						0.75	wh-ye
B61-4						0.75	bk-or
B61-5						0.75	bk-bl
B141-1 -1							
B141-1 2							
B141-1 3							
B141-2 1							
B141-2 2							
B141-2 3							

Interconnection list:

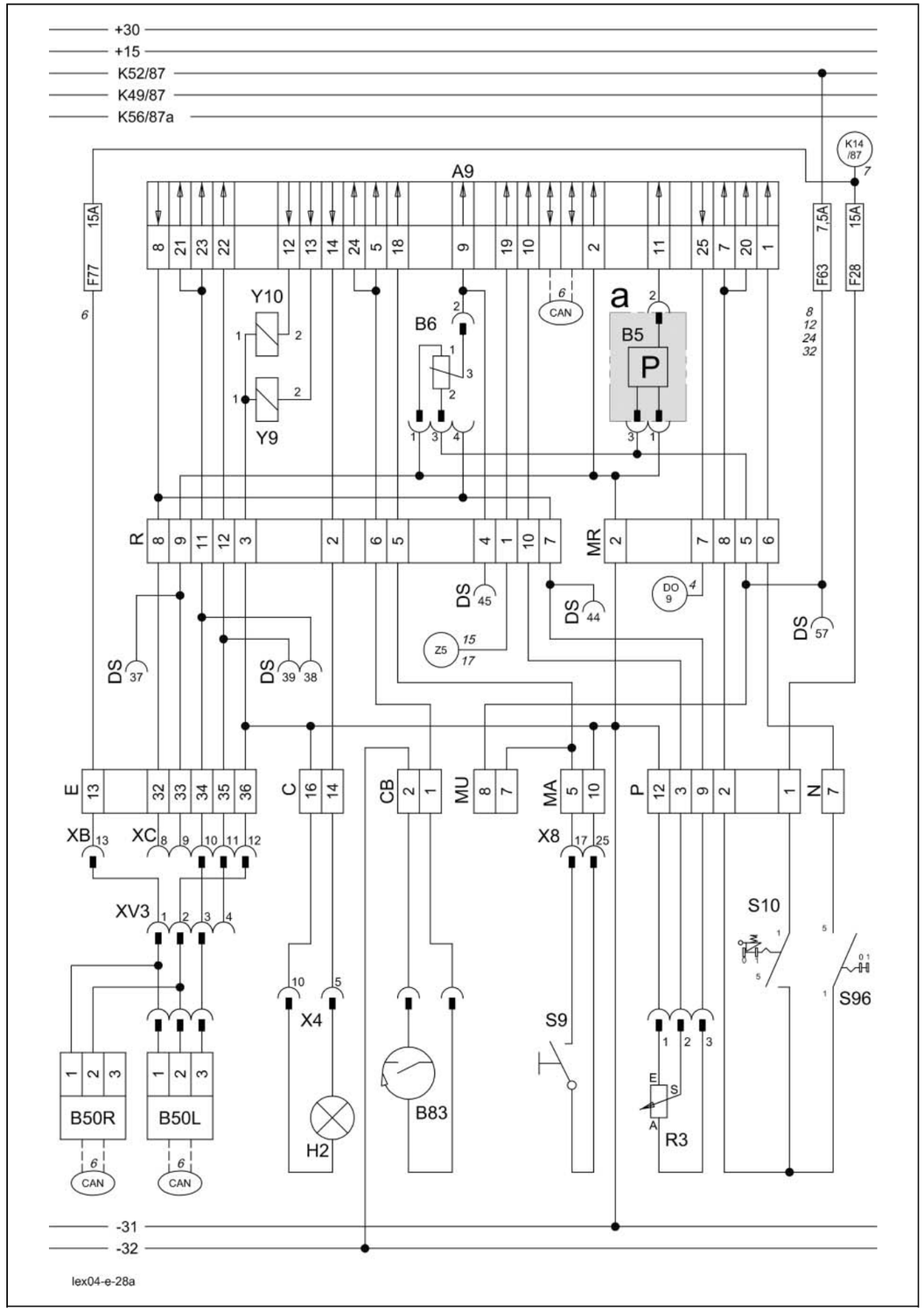
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B62-1						0.75	br
B62-2						0.75	gr
B62-3						0.75	gn
B62-4						0.75	bk-bl
B75-1						1.0	br
B75-2						1.0	or-ye
B75-3						1.0	bk
B76-1						1.0	br
B76-2						1.0	or-ye
B76-3						1.0	bk
Y52-1						1.0	br
Y52-2						0.75	bk-gr

28a

AUTOPILOT

Laser system

28a AUTOPILOT – Laser system



Key to diagram: Coordinates

A9	AUTOPILOT module	2-i-20
B5	Working hydraulics / Autopilot oil pressure sensor (for pressure-controlled equipment)	4-n-19
B6	AUTOPILOT wheel angle sensor	6-r-18
B50 R	AUTOPILOT laser sensor, left	6-e-10
B50 L	AUTOPILOT laser sensor, right	6-e-26
B83	AUTOPILOT OFF sensor (overrider switch)	5-g-18
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
H2	AUTOPILOT signal light	4-g-18
K14	Threshing mechanism relay	4-i-20
K52	Power supply relay	4-i-20
R3	AUTOPILOT centralizing switch (set value)	3-h-17
S9	AUTOPILOT ON switch	4-g-17
S10	AUTOPILOT main switch	3-h-17
S96	AUTOPILOT laser right/left switch	3-h-17
X4	Steering column indicator lights connector	4-g-18
XB	Multifunction coupling B connector	8-f-20
XC	Multifunction coupling C connector	8-f-20
XV3	AUTOPILOT variant plug connector	8-f-20
Y9	AUTOPILOT left solenoid coil	4-n-19
Y10	AUTOPILOT right solenoid coil	4-n-19
Z5	Seat contact actual value switch	4-h-18

a- provided depending on equipment fitted

Measured value table:

Item	Component	Measured value	Remark
B5	Working hydraulics / Autopilot oil pressure	12 V 0.25 V - 4.75 V 0.25 V = 0 bar 4.75 V = 250 bar	Power supply Signal / linear, Master valve (Y77) circuit via module (A9) - On at 135 bar - Off at 165 bar
B6	AUTOPILOT wheel angle	12 V 0.25 V – 4.75 V	Power supply Signal
B50	AUTOPILOT laser	6° - 0° - 6° 1.0 V - 2.5 V - 4.0 V	See Description of function
R3	Potentiometer	4.70 kΩ 1.7 - 6.4 kΩ	(Pin A-E) coil (Pin S-E) slider
Y 9 Y10	Solenoid coil	3.8 A 3.2 Ω	See inscription, without diode

Description of function:

AUTOPILOT

When the road travel circuit is unlocked and the threshing mechanism is engaged, the AUTOPILOT module (A9) is supplied with power by the main switch (S10).

Following the start signal from switch (S9), the solenoid coils (Y9/Y10) are energized according to the signals:
- Sensors (B7/B8) and/or
- Laser pilot (B50)
- of the GPS steering system (via CAN bus)

The control of the steering position is performed by the wheel angle sensor (B6) in the steering cylinder.

For safety reasons, the autopilot function is interrupted immediately by the signal of the overrider switch (B83) when using manual steering. If the driver seat is left, the seat contact (Z5) will interrupt the autopilot function after approx. 5 s.

The centralizing switch (R3) enables the machine to drive precisely straight ahead even when driving on a slope.

For a quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator. If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9 - pin 25) until the pressure level reaches approx. 165 bar again.

Accumulator filling

For quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator.

- pressure-controlled (by B5)

If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9-/ 25) until the pressure reaches approx. 165 bar again.
An existing oil pressure sensor (B5) is automatically identified by the AUTOPILOT module (A9). There is no need for configuration.
If no oil pressure sensor (B5) exists or if it fails, the Autopilot system automatically switches over to time-controlled filling of the accumulator.

- time-controlled (without B5)

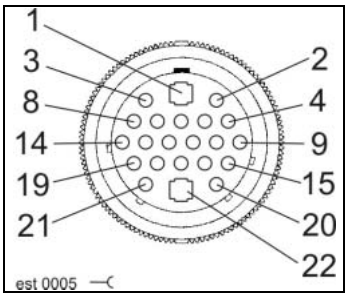
The accumulator is filled cyclically. The steering cylinder path is considered in this process.
After activating the Autopilot function, the AUTOPILOT module (A9) actuates the master valve (Y77) for 0.7 sec. The accumulator pressure thus corresponds to the working hydraulics system pressure.
The path covered by the steering cylinder as a function of steering movements is added up in the AUTOPILOT module (A9). After a path corresponding roughly to a drop of accumulator pressure to 150 bar, the AUTOPILOT module (A9) again actuates the master valve (Y77) automatically for 0.7 sec.

Description of function:

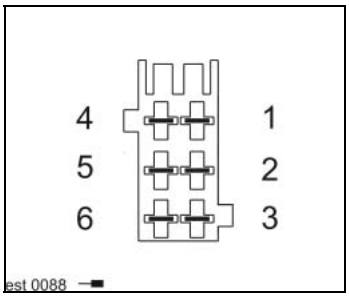
Laser system function	The laser beam emitted from the unit is reflected about 14 m ahead of the machine and received by the second optical system. Using the difference between the travel time of the signal between standing crop and stubbles, an edge is identified on which the machine is steered. The alignment of the laser pilot in the field is by means of a manually cut edge of standing crop. In this process, the unit is adjusted both vertically (V) and horizontally (H) until the two inside LEDs of the corresponding LED band light up in the cross-hairs (F).
Sensor identification Sensor / laser left/right	By starting the menu item "Front attachment learn" in terminal A30, the type of sensor is automatically identified (sensor or laser system). Any other terminals (e.g. GPS-controlled steering) must be switched off during learning.
Setting in terminal	The basic setting of the Autopilot system (straight ahead travel, sensitivity, front attachment sensor zero point) is performed in the CEBIS terminal in the "Tachometer" sub-menu.

Connector pin definition:

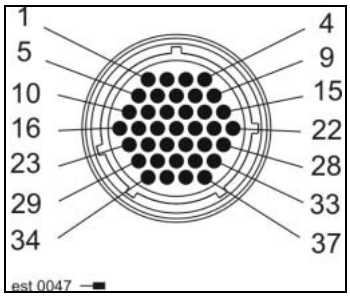
Socket C



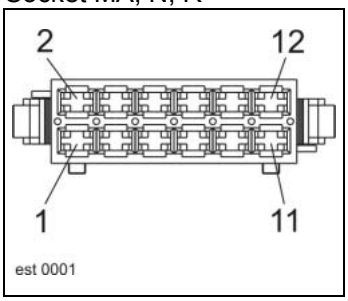
Socket CB



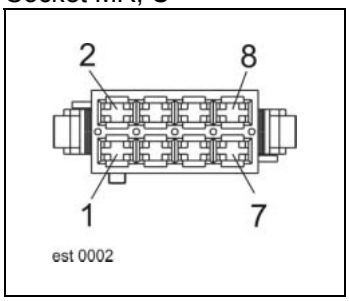
Connector E



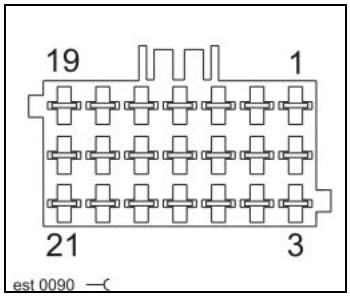
Socket MA, N, R



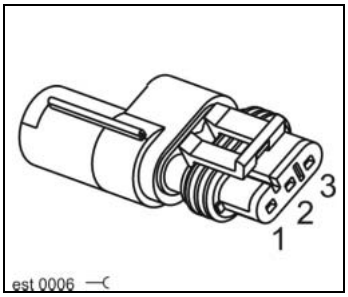
Socket MR, U



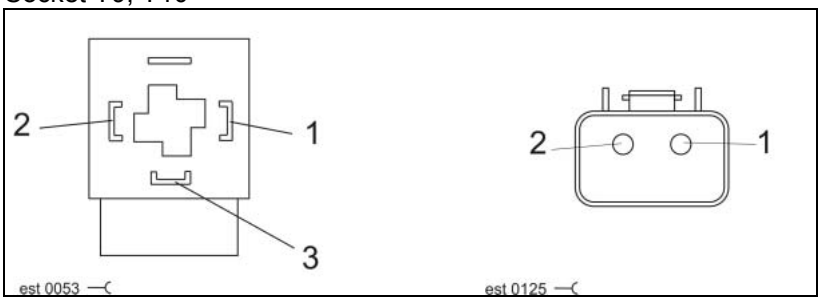
Socket P



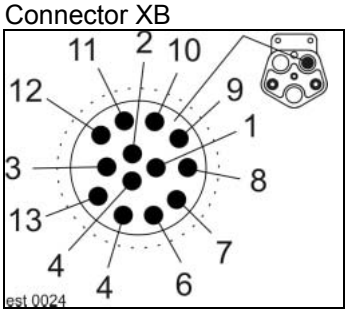
Socket B5



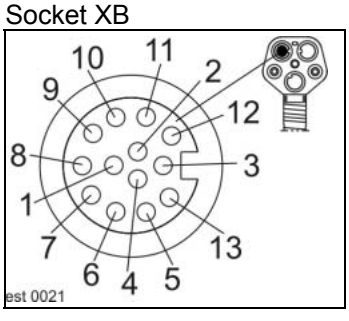
Socket Y9, Y10



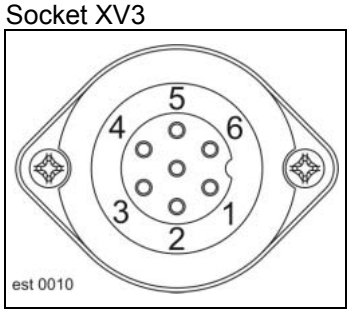
Connector XB



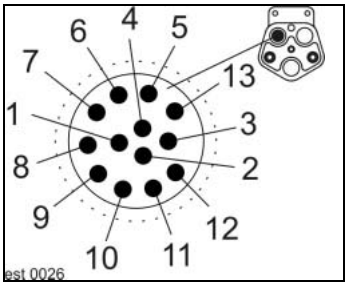
Socket XB



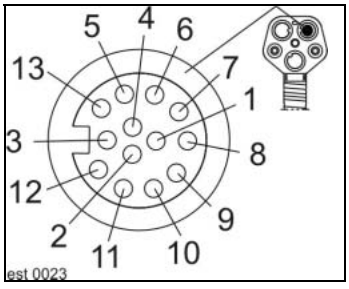
Socket XV3



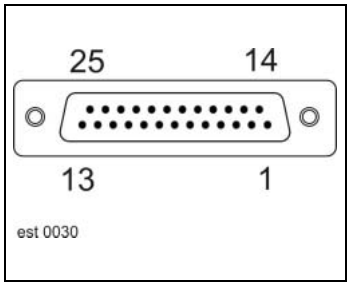
Connector XC



Socket XC



Socket X8



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 14	R 2					0.35	bl-gr
C 16	-31					1.5	br
CB 1	-31					0.75	br
CB 2	A 34	B 33	BB 12	A8 2	A16 2	0.75	gn
	Q 12	E 37	Bridge a	Z 8			
E 13	F77 a					1.5	bk-bl
E 32	R 8					0.75	or-bl
E 33	R 9	DS 37				0.75	or-bk
E 34	R 11	DS 38				0.75	or-gn
E 35	R 12	DS 39				0.75	or-gr
E 36	-31					1.5	br
MA 5	R 5	MU 7				0.5	gn-bl
MA 10	-31					1.5	br
MR 2	-31						
MR 5	F63 a	BB 13	B 30	MU 8	DS 57		
MR 6	N 7						
MR 7	DO 9						
MR 8	P 2						
MU 7	R 5	MA 5					
MU 8	F63 a	BB 13	MR 5	B 30	DS 57		
N 7	MR 6					0.5	br-rd
P 1	F28 a					1.5	rd-wh
P 2	MR 8					1.5	rd-bk
P 3	R 10					0.5	bl-rd
P 9	R 7	DS 44				0.5	rd-ye
P 12	-31					2.5	br
B5-1						1.0	br
B5-2						1.0	wh-gn
B5-3						1.0	rd-gr
B6-1						1.0	br
B6-2						1.0	pi-br
B6-3						1.0	rd-gr

Interconnection list:

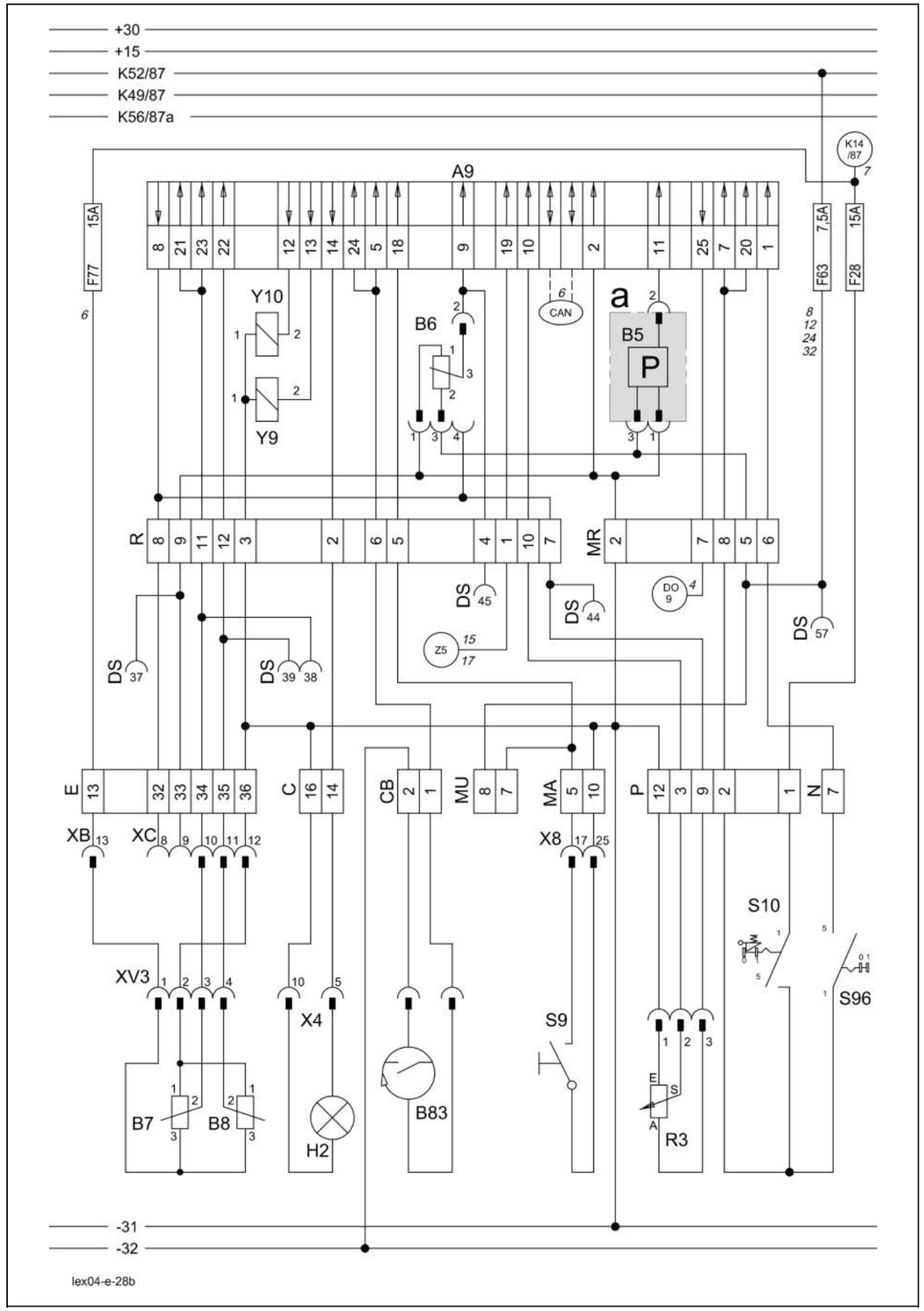
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X8-17						0.5	ye-rd
X8-25						1.5	br
XB-13						1.0	wh-ye
XC-8						0.75	or-bl
XC-9						0.75	or-bk
XC-10						0.75	or-gn
XC-11						0.75	or-gr
XC-12						1.0	br
XV3-1						0.75	bk-bl
XV3-2						0.75	br
XV3-3						0.75	or-gn
XV3-4						0.75	ye
Y9-1						1.0	br
Y9-2						1.0	ye-bk
Y10-1						1.0	br
Y10-2						1.0	gn-bk

28b

AUTOPILOT

Feeler system

28b AUTOPILOT – Feeler system



Key to diagram:

Coordinates

A9	AUTOPILOT module	2-i-20
B5	Working hydraulics / Autopilot oil pressure sensor (for pressure-controlled equipment)	4-n-19
B6	AUTOPILOT wheel angle sensor	6-r-18
B7	AUTOPILOT feeler sensor, left	8-c-18
B8	AUTOPILOT feeler sensor, right	8-c-18
B83	AUTOPILOT OFF sensor (overrider switch)	5-g-18
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
H2	AUTOPILOT signal light	4-g-18
K14	Threshing mechanism relay	4-i-20
K52	Power supply relay	4-i-20
R3	AUTOPILOT centralizing switch (set value)	3-h-17
S9	AUTOPILOT ON switch	4-g-17
S10	AUTOPILOT main switch	3-h-17
S96	AUTOPILOT laser right/left switch	3-h-17
X4	Steering column indicator lights connector	4-g-18
XB	Multifunction coupling B connector	8-f-20
XC	Multifunction coupling C connector	8-f-20
XV3	AUTOPILOT variant plug connector	8-f-20
Y9	AUTOPILOT left solenoid coil	4-n-19
Y10	AUTOPILOT right solenoid coil	4-n-19
Z5	Seat contact actual value switch	4-h-18

a- provided depending on equipment fitted

Measured value table:

Item	Component	Measured value	Remark
B5	Working hydraulics / Autopilot oil pressure	12 V 0.25 V - 4.75 V 0.25 V = 0 bar 4.75 V = 250 bar	Power supply Signal / linear, Master valve (Y77) circuit via module (A9) - On at 135 bar - Off at 165 bar
B6	AUTOPILOT wheel angle	12 V 0.25 V - 4.75 V	Power supply Signal
B7 B8	AUTOPILOT laser, digital system	0.5 V - 4.5 V	See Description of function
R3	Potentiometer	4.70 kΩ 1.7 - 6.4 kΩ	(Pin A-E) coil (Pin S-E) slider
Y 9 Y10	Solenoid coil	3.8 A 3.2 Ω	See inscription, without diode

Description of function:

AUTOPILOT

When the road travel circuit is unlocked and the threshing mechanism is engaged, the AUTOPILOT module (A9) is supplied with power by the main switch (S10).

Following the start signal from switch (S9), the solenoid coils (Y9/Y10) are energized according to the signals:
- Sensors (B7/B8) and/or
- Laser pilot (B50)
- of the GPS steering system (via CAN bus)

The control of the steering position is performed by the wheel angle sensor (B6) in the steering cylinder.

For safety reasons, the autopilot function is interrupted immediately by the signal of the overrider switch (B83) when using manual steering. If the driver seat is left, the seat contact (Z5) will interrupt the autopilot function after approx. 5 s.

The centralizing switch (R3) enables the machine to drive precisely straight ahead even when driving on a slope.

For a quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator. If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9 - pin 25) until the pressure level reaches approx. 165 bar again.

Accumulator filling

For quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator.

- pressure-controlled (by B5)

If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9-/ 25) until the pressure reaches approx. 165 bar again.
An existing oil pressure sensor (B5) is automatically identified by the AUTOPILOT module (A9). There is no need for configuration.
If no oil pressure sensor (B5) exists or if it fails, the Autopilot system automatically switches over to time-controlled filling of the accumulator.

- time-controlled (without B5)

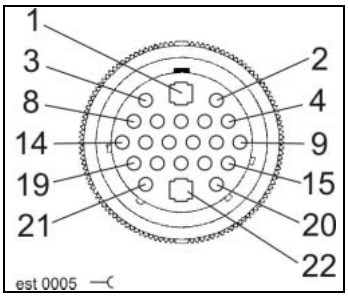
The accumulator is filled cyclically. The steering cylinder path is considered in this process.
After activating the Autopilot function, the AUTOPILOT module (A9) actuates the master valve (Y77) for 0.7 sec. The accumulator pressure thus corresponds to the working hydraulics system pressure.
The path covered by the steering cylinder as a function of steering movements is added up in the AUTOPILOT module (A9). After a path corresponding roughly to a drop of accumulator pressure to 150 bar, the AUTOPILOT module (A9) again actuates the master valve (Y77) automatically for 0.7 sec.

Description of function:

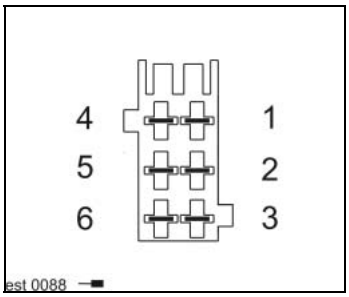
Sensor identification Sensor / laser left/right	By starting the menu item "Front attachment learn" in terminal A30, the type of sensor is automatically identified (sensor or laser system). Any other terminals (e.g. GPS-controlled steering) must be switched off during learning.
Setting in terminal	The basic setting of the Autopilot system (straight ahead travel, sensitivity, front attachment sensor zero point) is performed in the CEBIS terminal in the "Tachometer" sub-menu.

Connector pin definition:

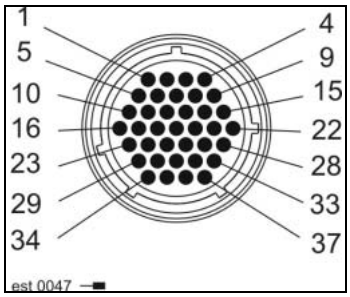
Socket C



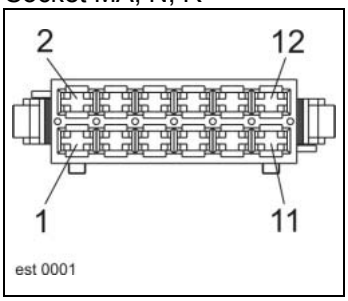
Socket CB



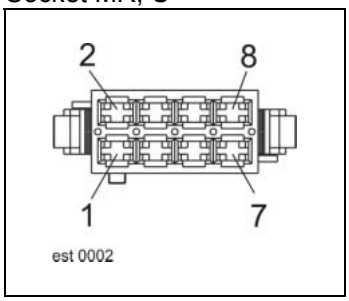
Connector E



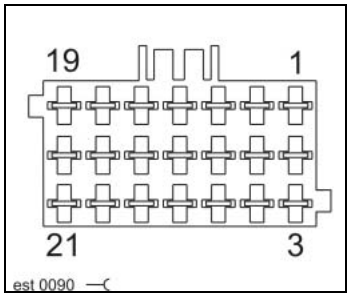
Socket MA, N, R



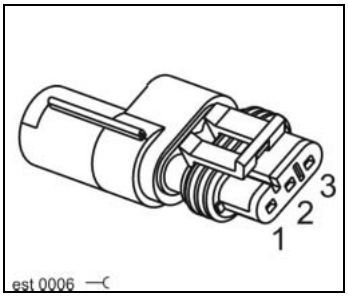
Socket MR, U



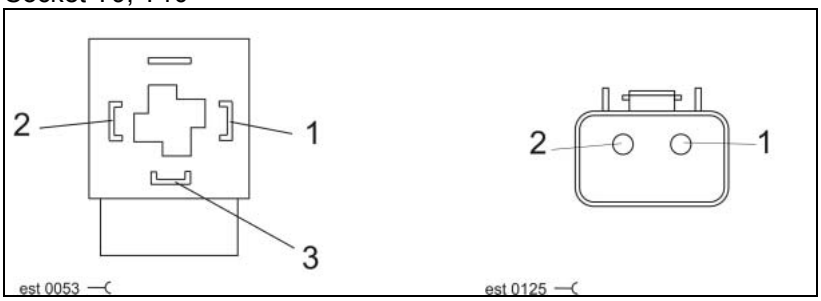
Socket P



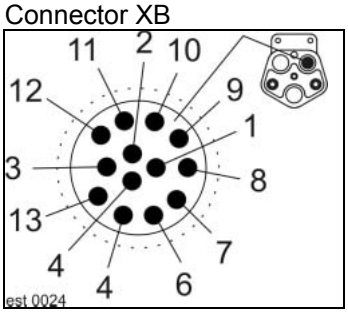
Socket B5



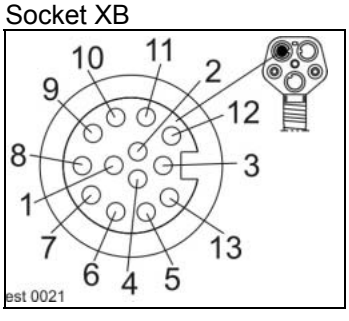
Socket Y9, Y10



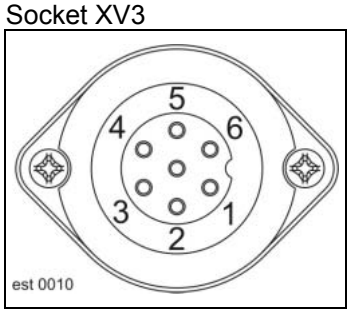
Connector XB



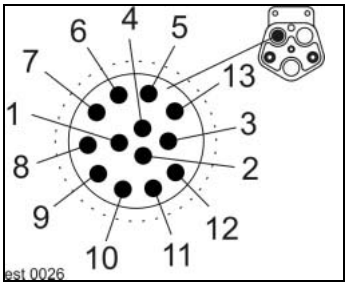
Socket XB



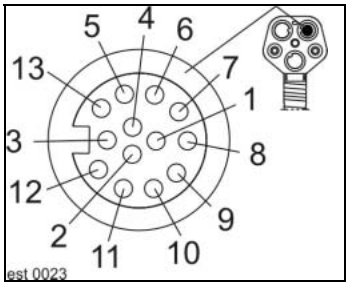
Socket XV3



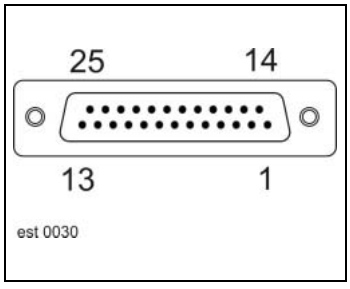
Connector XC



Socket XC



Socket X8



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 14	R 2					0.35	bl-gr
C 16	-31					1.5	br
CB 1	-31					0.75	br
CB 2	A 34	B 33	BB 12	A8 2	A16 2	0.75	gn
	Q 12	E 37	Bridge a	Z 8			
E 13	F77 a					1.5	bk-bl
E 32	R 8					0.75	or-bl
E 33	R 9	DS 37				0.75	or-bk
E 34	R 11	DS 38				0.75	or-gn
E 35	R 12	DS 39				0.75	or-gr
E 36	-31					1.5	br
MA 5	R 5	MU 7				0.5	gn-bl
MA 10	-31					1.5	br
MR 2	-31						
MR 5	F63 a	BB 13	B 30	MU 8	DS 57		
MR 6	N 7						
MR 7	DO 9						
MR 8	P 2						
MU 7	R 5	MA 5					
MU 8	F63 a	BB 13	MR 5	B 30	DS 57		
N 7	MR 6					0.5	br-rd
P 1	F28 a					1.5	rd-wh
P 2	MR 8					1.5	rd-bk
P 3	R 10					0.5	bl-rd
P 9	R 7	DS 44				0.5	rd-ye
P 12	-31					2.5	br
B5-1						1.0	br
B5-2						1.0	wh-gn
B5-3						1.0	rd-gr
B6-1						1.0	br
B6-2						1.0	pi-br
B6-3						1.0	rd-gr

Interconnection list:

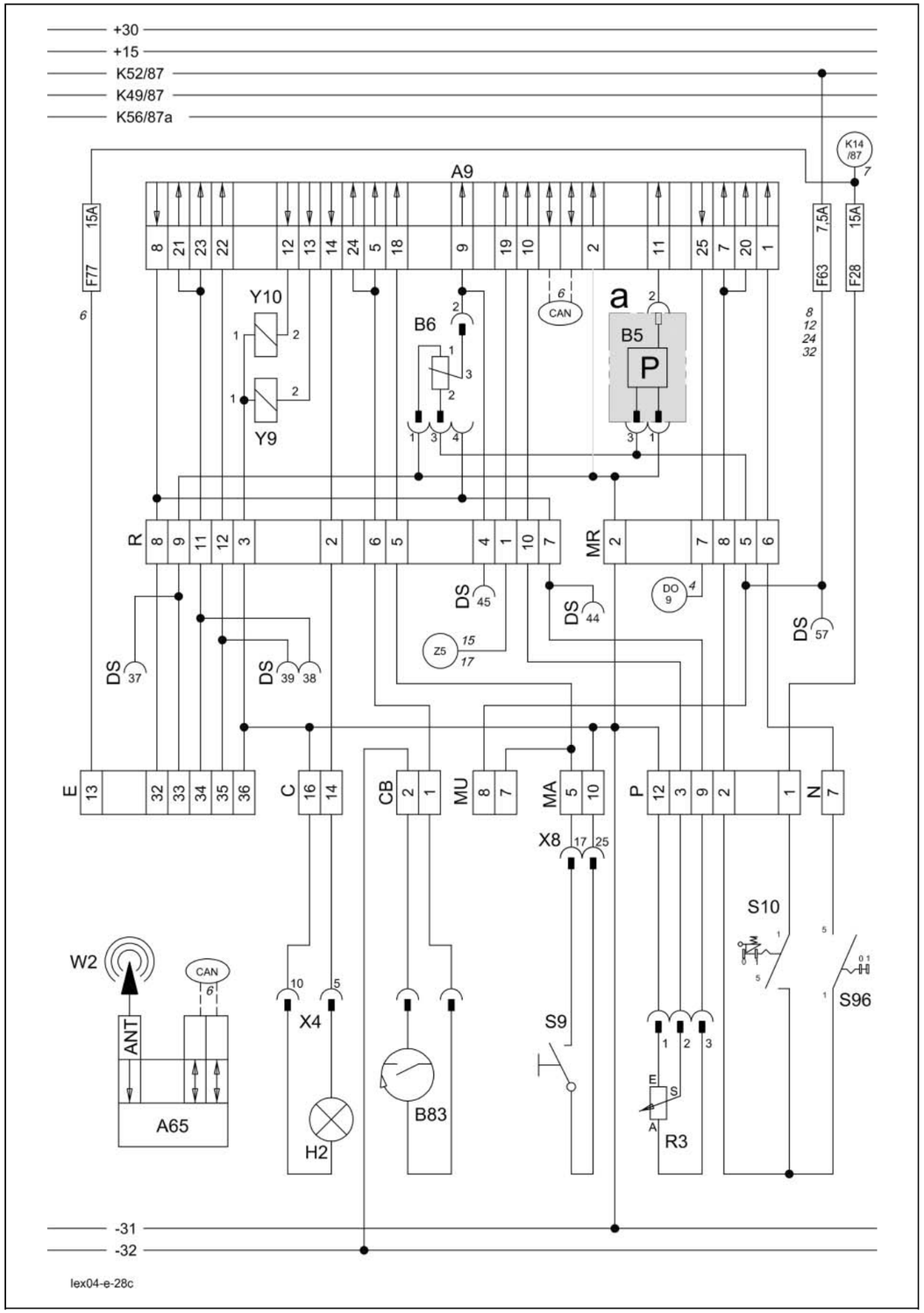
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X8-17						0.5	ye-rd
X8-25						1.5	br
XB-13						1.0	wh-ye
XC-8						0.75	or-bl
XC-9						0.75	or-bk
XC-10						0.75	or-gn
XC-11						0.75	or-gr
XC-12						1.0	br
XV3-1						0.75	or-bl
XV3-2						0.75	or-bk
XV3-3						0.75	or-gn
XV3-4						0.75	or-gr
Y9-1						1.0	br
Y9-2						1.0	ye-bk
Y10-1						1.0	br
Y10-2						1.0	gn-bk

28c

AUTOPILOT

GPS-controlled steering

28c AUTOPILOT – GPS-controlled steering



Key to diagram:

Coordinates

A9	AUTOPILOT module	2-i-20
B5	Working hydraulics / Autopilot oil pressure sensor (for pressure-controlled equipment)	4-n-19
B6	AUTOPILOT wheel angle sensor	6-r-18
B83	AUTOPILOT OFF sensor (overrider switch)	5-g-18
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
H2	AUTOPILOT signal light	4-g-18
K14	Threshing mechanism relay	4-i-20
K52	Power supply relay	4-i-20
R3	AUTOPILOT centralizing switch (set value)	3-h-17
S9	AUTOPILOT ON switch	4-g-17
S10	AUTOPILOT main switch	3-h-17
S96	AUTOPILOT laser right/left switch	3-h-17
W2	GPS antenna	2-f-18
X4	Steering column indicator lights connector	4-g-18
XV3	AUTOPILOT variant plug connector	8-f-20
Y9	AUTOPILOT left solenoid coil	4-n-19
Y10	AUTOPILOT right solenoid coil	4-n-19
Z5	Seat contact actual value switch	4-h-18

a- provided depending on equipment fitted

Measured value table:

Item	Component	Measured value	Remark
B5	Working hydraulics / Autopilot oil pressure	12 V 0.25 V - 4.75 V 0.25 V = 0 bar 4.75 V = 250 bar	Power supply Signal / linear, Master valve (Y77) circuit via module (A9) - On at 135 bar - Off at 165 bar
B6	AUTOPILOT wheel angle	12 V 0.25 V - 4.75 V	Power supply Signal
R3	Potentiometer	4.70 kΩ 1.7 - 6.4 kΩ	(Pin A-E) coil (Pin S-E) slider
Y 9 Y10	Solenoid coil	3.8 A 3.2 Ω	See inscription, without diode

Description of function:

AUTOPILOT

When the road travel circuit is unlocked and the threshing mechanism is engaged, the AUTOPILOT module (A9) is supplied with power by the main switch (S10).

Following the start signal from switch (S9), the solenoid coils (Y9/Y10) are energized according to the signals:
- Sensors (B7/B8) and/or
- Laser pilot (B50)
- of the GPS steering system (via CAN bus)

The control of the steering position is performed by the wheel angle sensor (B6) in the steering cylinder.

For safety reasons, the autopilot function is interrupted immediately by the signal of the overrider switch (B83) when using manual steering. If the driver seat is left, the seat contact (Z5) will interrupt the autopilot function after approx. 5 s.

The centralizing switch (R3) enables the machine to drive precisely straight ahead even when driving on a slope.

For a quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator. If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9 - pin 25) until the pressure level reaches approx. 165 bar again.

Accumulator filling

For quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator.

- pressure-controlled (by B5)

If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9-/ 25) until the pressure reaches approx. 165 bar again.
An existing oil pressure sensor (B5) is automatically identified by the AUTOPILOT module (A9). There is no need for configuration.
If no oil pressure sensor (B5) exists or if it fails, the Autopilot system automatically switches over to time-controlled filling of the accumulator.

- time-controlled (without B5)

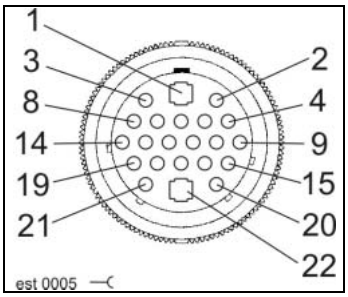
The accumulator is filled cyclically. The steering cylinder path is considered in this process.
After activating the Autopilot function, the AUTOPILOT module (A9) actuates the master valve (Y77) for 0.7 sec. The accumulator pressure thus corresponds to the working hydraulics system pressure.
The path covered by the steering cylinder as a function of steering movements is added up in the AUTOPILOT module (A9). After a path corresponding roughly to a drop of accumulator pressure to 150 bar, the AUTOPILOT module (A9) again actuates the master valve (Y77) automatically for 0.7 sec.

Description of function:

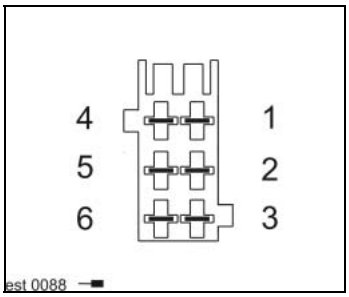
Sensor identification Sensor / laser left/right	By starting the menu item "Front attachment learn" in terminal A30, the type of sensor is automatically identified (GPS, sensor or laser system). The GPS pilot terminal (A65) must be switched on during learning.
Setting in terminal	The basic setting of the Autopilot system (straight ahead travel, sensitivity, front attachment sensor zero point) is performed in the CEBIS terminal in the "Tachometer" sub-menu.

Connector pin definition:

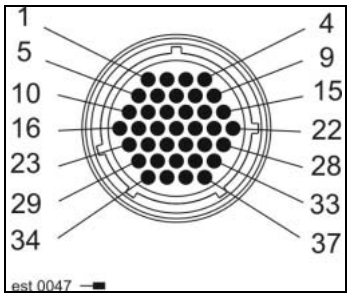
Socket C



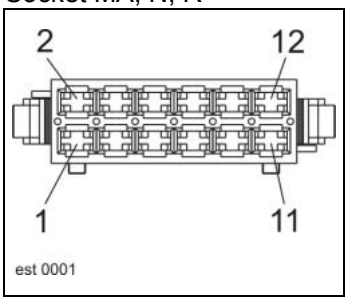
Socket CB



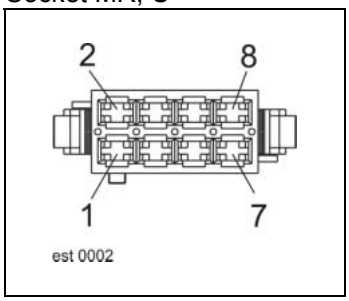
Connector E



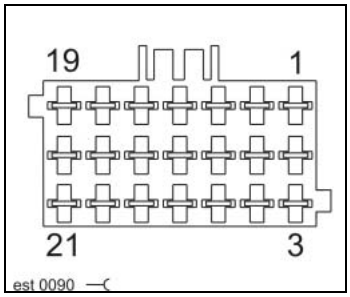
Socket MA, N, R



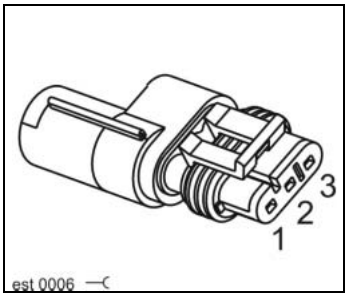
Socket MR, U



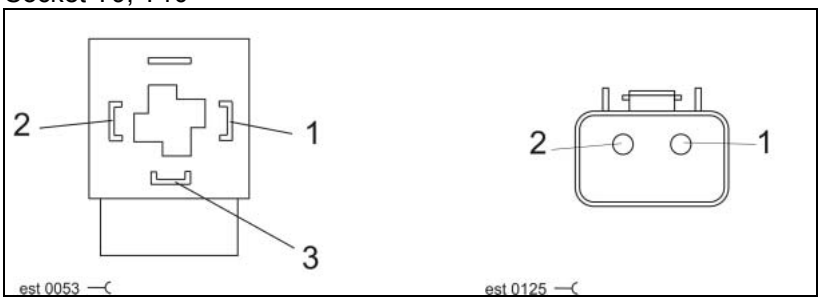
Socket P



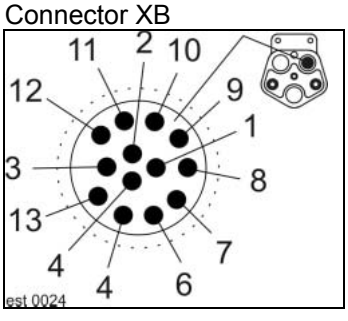
Socket B5



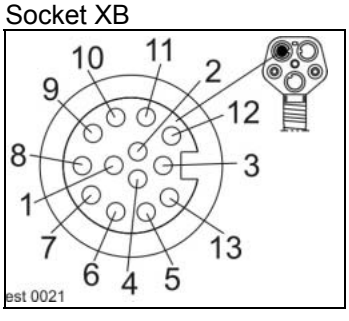
Socket Y9, Y10



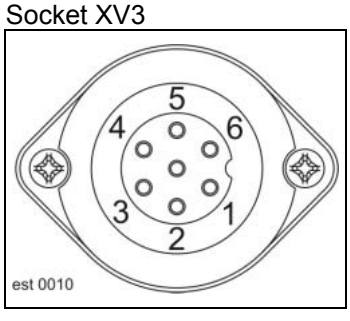
Connector XB



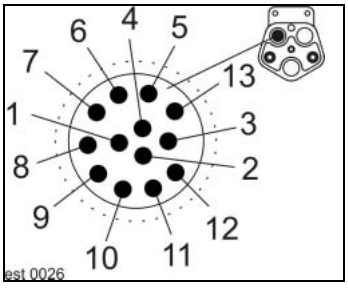
Socket XB



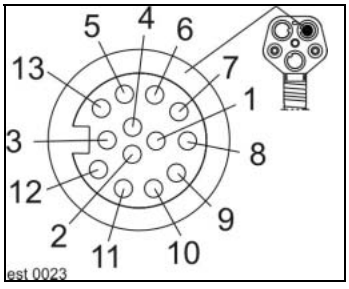
Socket XV3



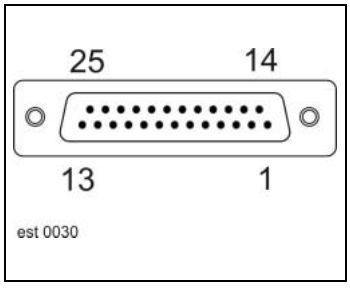
Connector XC



Socket XC



Socket X8



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 14	R 2					0.35	bl-gr
C 16	-31					1.5	br
CB 1	-31					0.75	br
CB 2	A 34	B 33	BB 12	A8 2	A16 2	0.75	gn
	Q 12	E 37	Bridge a	Z 8			
E 13	F77 a					1.5	bk-bl
E 32	R 8					0.75	or-bl
E 33	R 9	DS 37				0.75	or-bk
E 34	R 11	DS 38				0.75	or-gn
E 35	R 12	DS 39				0.75	or-gr
E 36	-31					1.5	br
MA 5	R 5	MU 7				0.5	gn-bl
MA 10	-31					1.5	br
MR 2	-31						
MR 5	F63 a	BB 13	B 30	MU 8	DS 57		
MR 6	N 7						
MR 7	DO 9						
MR 8	P 2						
MU 7	R 5	MA 5					
MU 8	F63 a	BB 13	MR 5	B 30	DS 57		
N 7	MR 6					0.5	br-rd
P 1	F28 a					1.5	rd-wh
P 2	MR 8					1.5	rd-bk
P 3	R 10					0.5	bl-rd
P 9	R 7	DS 44				0.5	rd-ye
P 12	-31					2.5	br
B5-1						1.0	br
B5-2						1.0	wh-gn
B5-3						1.0	rd-gr
B6-1						1.0	br
B6-2						1.0	pi-br
B6-3						1.0	rd-gr

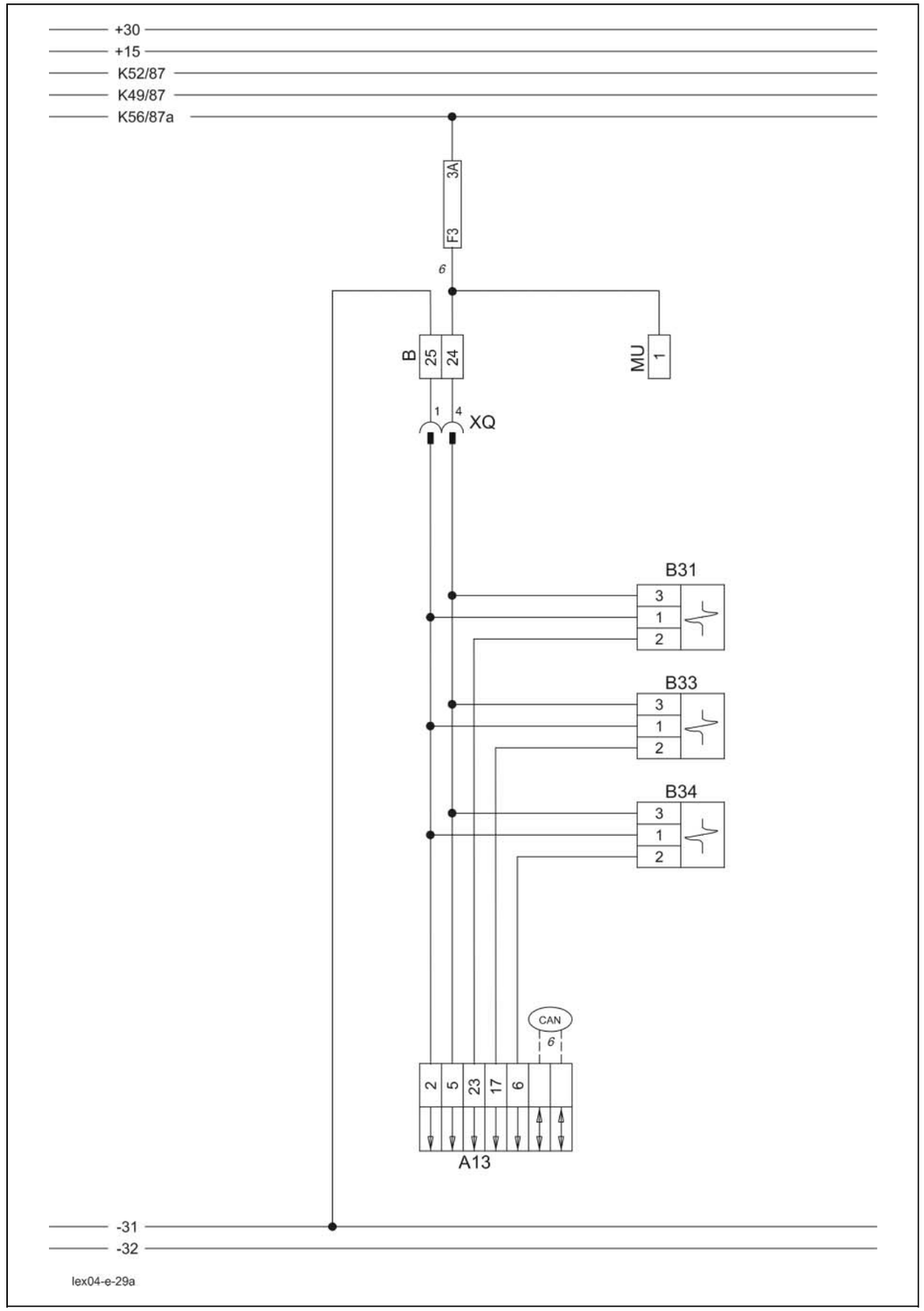
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X8-17						0.5	ye-rd
X8-25						1.5	br
Y9-1						1.0	br
Y9-2						1.0	ye-bk
Y10-1						1.0	br
Y10-2						1.0	gn-bk

29a

Performance monitor

29a Performance monitor



Key to diagram:

Coordinates

A13	Performance monitor module (DKG)	4-p-20
B31	Cleaning performance monitor sensor	6-q-18
B33	Residual separation performance monitor sensor (left)	3-s-19
B34	Residual separation performance monitor sensor (right)	3-s-17
K56	Electronic unit plus relay	4-i-20
XQ	Performance monitor connector	4-o-20

Measured value table:

Item	Component	Measured value	Remark
B31 B33 B34	Sensor	4 V	Basic signal

Description of function:

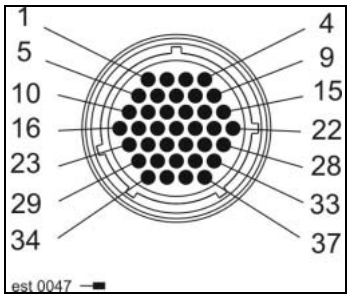
Performance monitor

The signals of the individual sensors are transmitted to module (A13). The sensitivity is adjusted in the CEBIS terminal (A30).

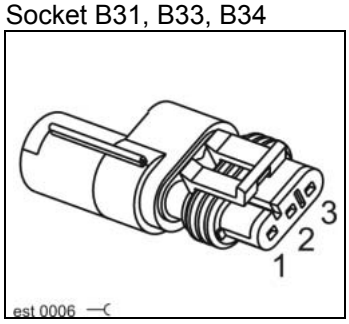
The sensors B31, B33 and B34 can be checked using the CEBIS terminal (A30), menu "Adjustments – Separation – Sensor test".

Connector pin definition:

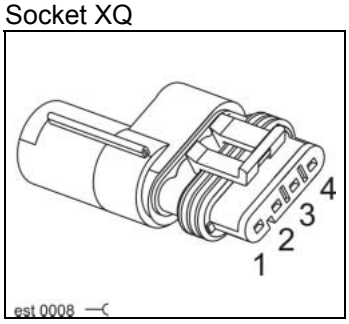
Connector B



Socket B31, B33, B34



Socket XQ



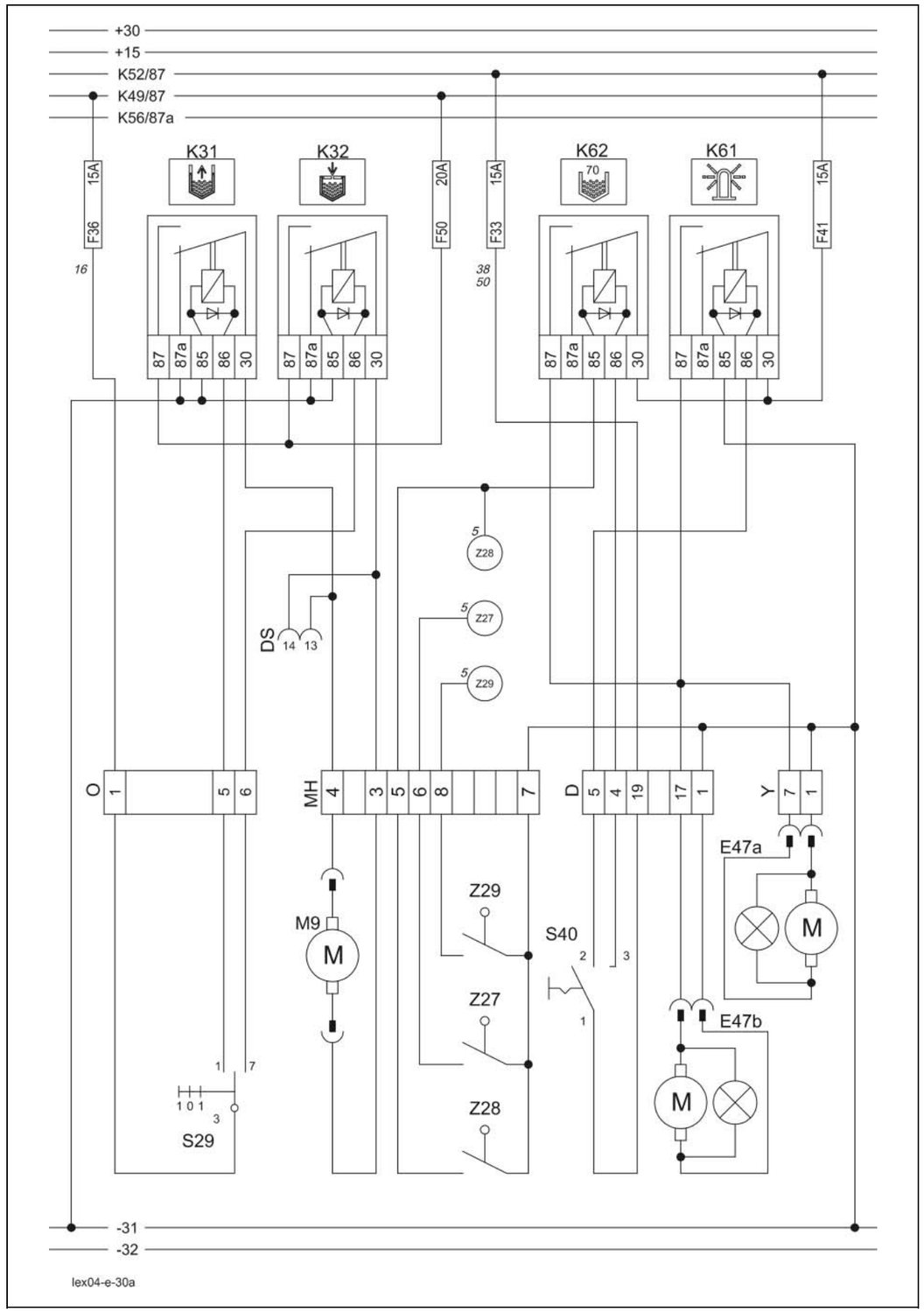
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
B 24	F03 a	MU 1				1.5	bk
B 25	-31					1.5	br-bl
B31-1						1.5	br-bl
B31-2						0.75	bl-gn
B31-3						1.5	bk
B33-1						1.5	br-bl
B33-2						0.75	bl-vi
B33-3						1.5	bk
B34-1						1.5	br-bl
B34-2						0.75	bl-gr
B34-3						1.5	bk
XQ-1						1.5	br-bl
XQ-4						1.5	bk

30a

Open / close grain tank (electric), grain tank full signal, warning beacon

30a Open / close grain tank (electric), grain tank full signal, warning beacon



Key to diagram:

Coordinates

DS	Diagnosis plug (63-pin) VIA	3-i-20
E47a	Warning beacon, front	2-g-19
E47b	Warning beacon, rear	2-u-18
K31	Open grain tank extension relay	4-i-20
K32	Close grain tank extension relay	4-i-20
K61	Warning beacon relay	4-i-20
K62	Grain tank full signal warning beacon relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
M9	Grain tank extension motor	2-k-18
S29	Grain tank extension switch	3-h-17
S40	Warning beacon switch	3-h-17
Z27	Grain tank 100% full indicator actual value switch	2-j-18
Z28	Grain tank 70% full indicator actual value switch	2-j-18
Z29	Grain tank extension open actual value switch	2-k-18

Measured value table:

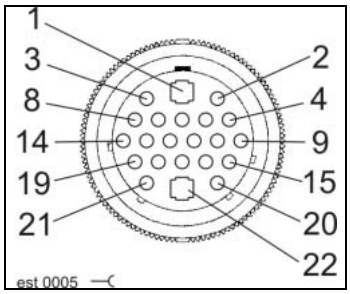
Item	Component	Measured value	Remark
K31 K32 K61 K62	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
M9	Electric motor	12 A	max. current

Description of function:

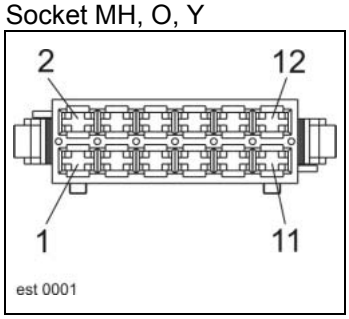
Grain tank extension (electric)	With the grain tank extension switch (S29), one of the relays K31 or K32 is actuated to open or close the grain tank. Depending on the sense of the rotation, the grain tank extension electric motor (M9) is supplied with earth by one of the relays K31/K32 on pin 87a, whereas the other relay, K32/K31, switches the voltage on pin 87.
Grain tank full indicator / Warning beacon	The earth signal of the 70% microswitch (Z28) and 100% microswitch (Z27) is displayed as a corresponding message on the terminal (A30). If the 70 % full signal is activated via warning beacon (E47a/b) through switch (S40), the warning beacon is activated via microswitch (Z28) and relay K62.

Connector pin definition:

Socket D



Socket MH, O, Y



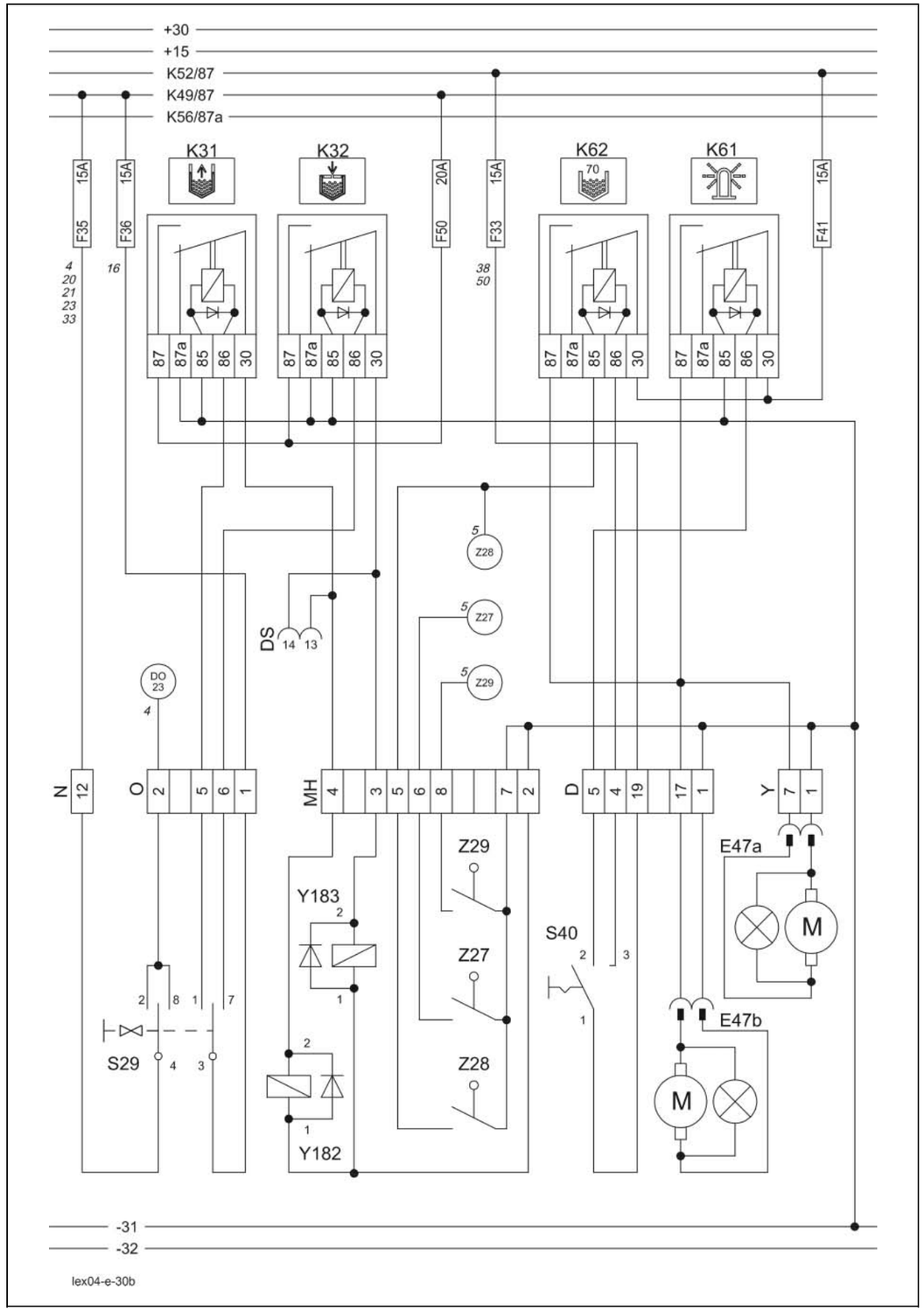
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
D 4	K62 86					0.5	bk-rd
D 5	K61 86					0.5	br-gn
D 17	Y 7	K61 87	K62 87			1.5	wh-vi
D 19	K24 30	F33 a				1.5	rd-wh
MH 3	K32 30	DS 14				2.5	ye
MH 4	K31 30	DS 13				2.5	wh
MH 5	A 14	K 62 85				1.0	br-vi
MH 6	A 9					1.0	br-bk
MH 7	-31					1.0	br
MH 8	A 10					1.0	br-gn
O 1	F36 a					2.5	bk-bl
O 5	K31 86					1.5	ye-bk
O 6	K32 86					1.5	ye-bl
Y 1	-31					2.5	br
Y 7	D 17	K61 87	K62 87			2.5	wh-vi

30b

Open / close grain tank (hydraulic), grain tank full signal, warning beacon

30b Open / close grain tank (hydraulic), grain tank full signal, warning beacon



Key to diagram:

Coordinates

DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
E47a	Warning beacon, front	2-g-19
E47b	Warning beacon, rear	2-u-18
K31	Open grain tank extension relay	4-i-20
K32	Close grain tank extension relay	4-i-20
K61	Warning beacon relay	4-i-20
K62	Grain tank full signal warning beacon relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
S29	Grain tank extension switch	3-h-17
S40	Warning beacon switch	3-h-17
Y182	Open grain tank extension solenoid coil	2-l-19
Y183	Close grain tank extension solenoid coil	2-l-19
Z27	Grain tank 100% full indicator actual value switch	2-j-18
Z28	Grain tank 70% full indicator actual value switch	2-j-18
Z29	Grain tank extension open actual value switch	2-k-18

Measured value table:

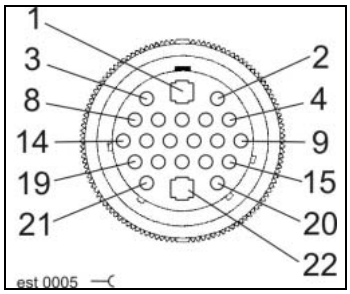
Item	Component	Measured value	Remark
K31 K32 K61 K62	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
Y182 Y183	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

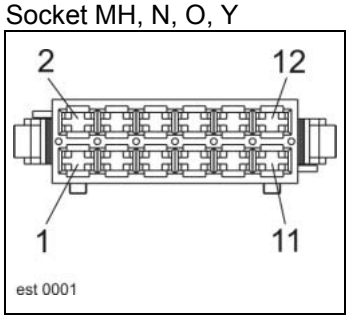
Grain tank extension (hydraulic)	When the road travel circuit is unlocked, relays (K31) and (K32) are supplied with power at pin 87. Earth is applied at pins 85 and 87a. The double push-button switch (S29) actuates the relays K31 and K32, actuating also the respective solenoid coil (Y182/Y183). Parallel to one of the solenoid coils (Y182/Y183), the diode PCB (DO) also actuates the master valve (Y77), since a buildup of pressure in the system is necessary for this function.
Grain tank full indicator / Warning beacon	The earth signal of the 70% microswitch (Z28) and 100% microswitch (Z27) is displayed as a corresponding message on the terminal (A30). If the 70 % full signal is activated via warning beacon (E47a/b) through switch (S40), the warning beacon is activated via microswitch (Z28) and relay K62.

Connector pin definition:

Socket D



Socket MH, N, O, Y



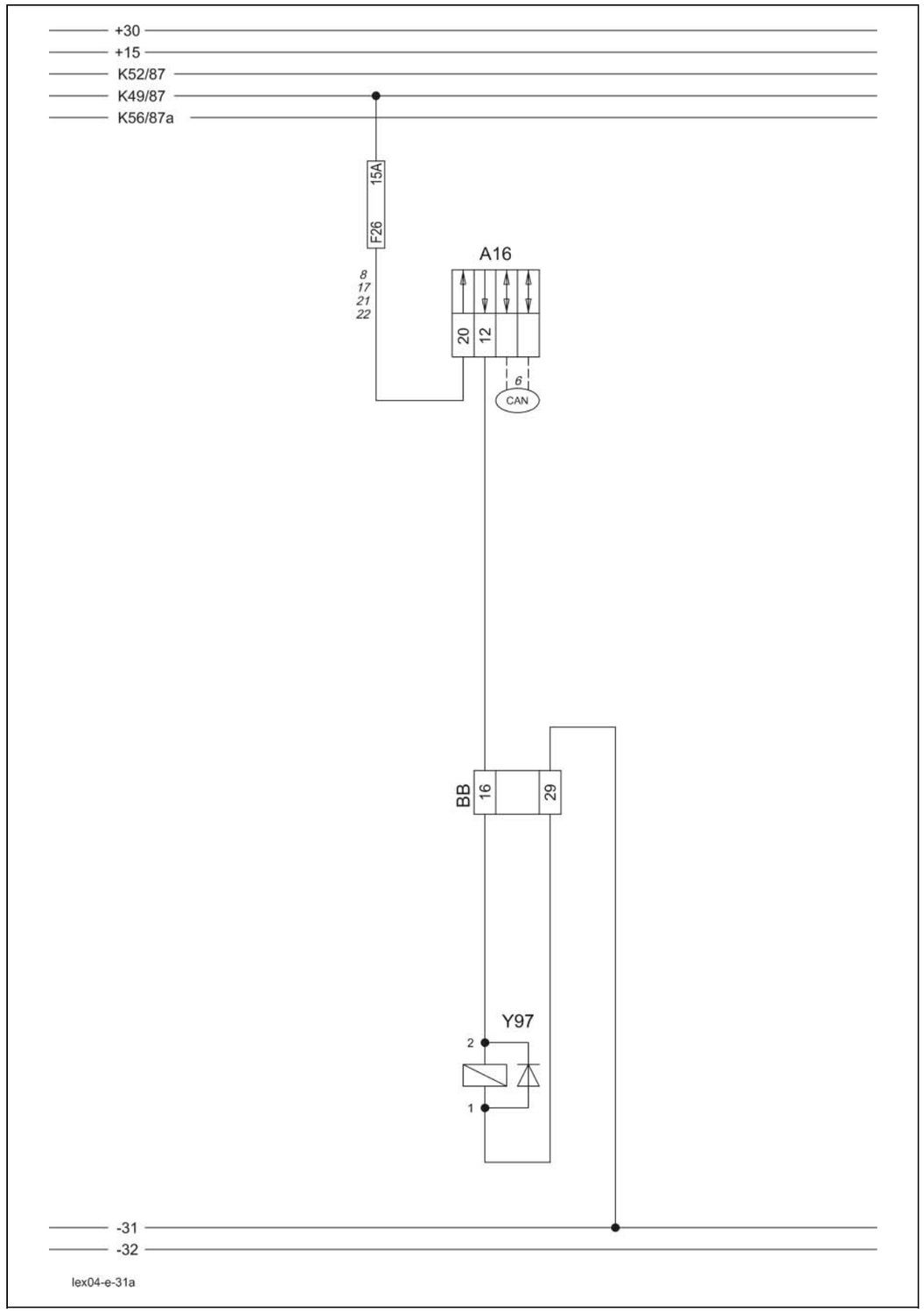
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
D 4	K62 86					0.5	bk-rd
D 5	K61 86					0.5	br-gn
D 17	Y 7	K61 87	K62 87			1.5	wh-vi
D 19	K24 30	F33 a				1.5	rd-wh
MH 2	31					1.5	br
MH 3	K32 30	DS 14				2.5	ye
MH 4	K31 30	DS 13				2.5	wh
MH 5	A 14	K 62 85				1.0	br-vi
MH 6	A 9					1.0	br-bk
MH 7	-31					1.0	br
MH 8	A 10					1.0	br-gn
N 12	F35a	U7	K5/86	K5/30	K6/86	2.5	bk-vi
O 1	F36 a					2.5	bk-bl
O 2	DO 23					0.5	ye-gn
O 5	K31 86					1.5	ye-bk
O 6	K32 86					1.5	ye-bl
Y 1	-31					2.5	br
Y 7	D 17	K61 87	K62 87			2.5	wh-vi

31a

Front attachment dampening

31a Front attachment dampening



Key to diagram:

Coordinates

A16	Reel controller module (HAS)	2-i-20
K49	Road travel main relay	4-i-20
Y97	Front attachment dampening solenoid coil	7-h-18

Measured value table:

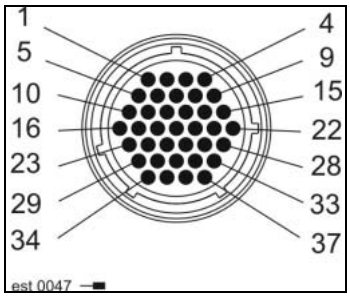
Item	Component	Measured value	Remark
Y97	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

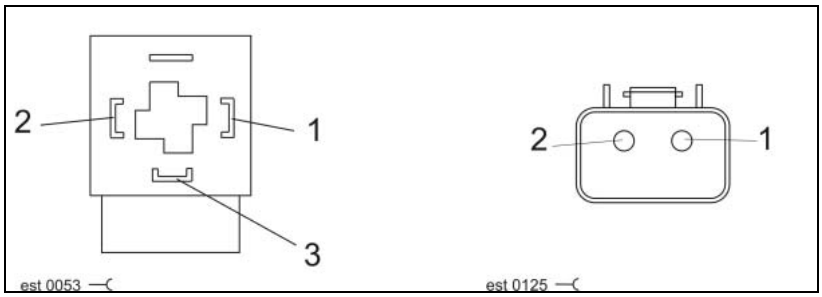
Front attachment dampening	Front attachment dampening is active when the solenoid coil (Y97) is not actuated. When the threshing mechanism and the cutterbar are engaged, the engine runs at max. engine idle speed and the working position is reached, cutterbar dampening is hydraulically blocked by solenoid coil (Y97). Reliable CAC function only be guaranteed in this way.

Connector pin definition:

Connector BB



Socket Y97



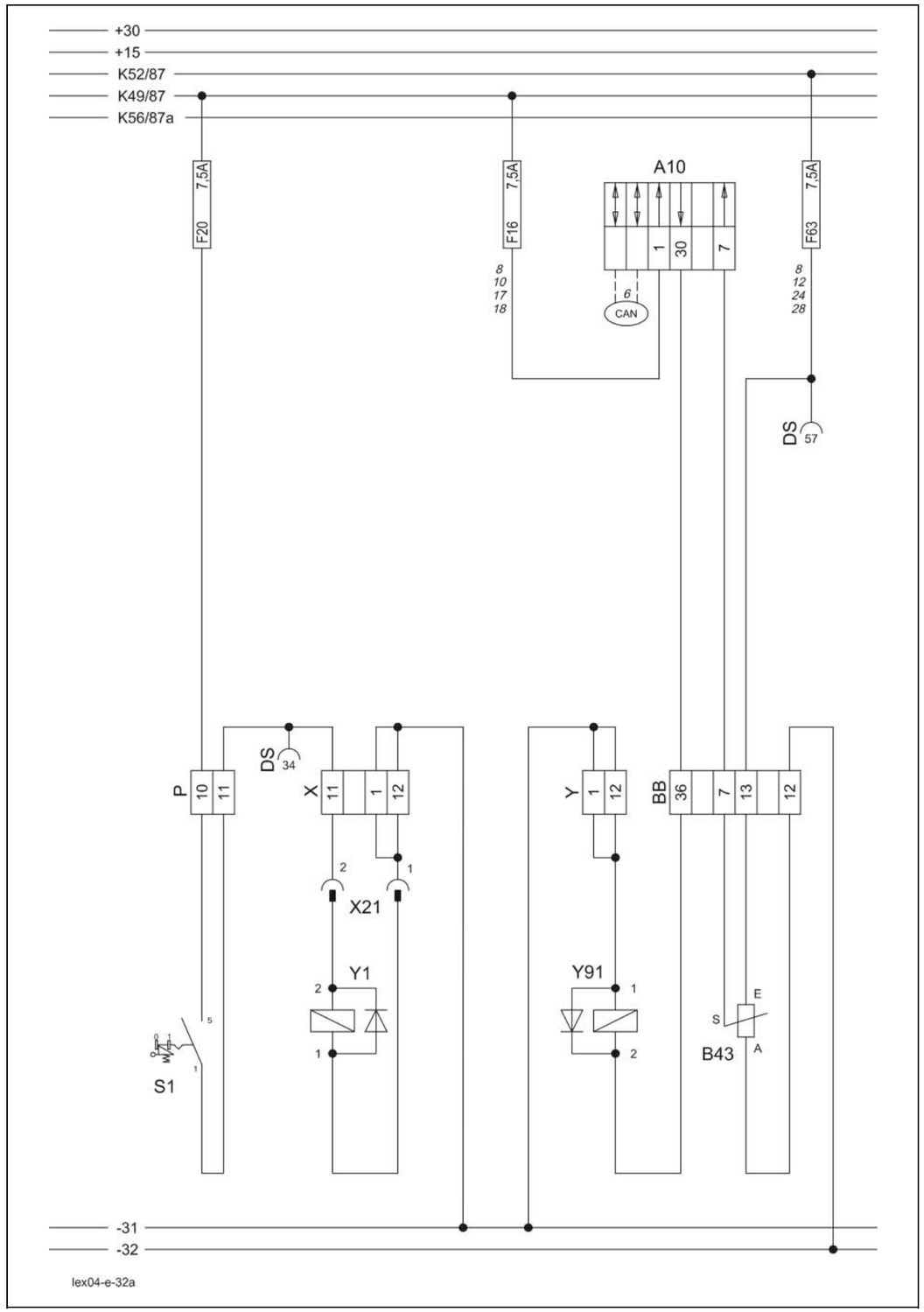
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
BB 16	A16-12					1.0	gr-ye
BB 29	-31					1.5	br
Y97-1						1.5	br
Y97-2						1.5	gr-ye

32a

All-wheel drive, fuel tank

32a All-wheel drive, fuel tank



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
B43	Fuel level sensor	3-q-16
DS	Diagnosis plug (63-pin) VIA	3-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
S1	4-Trac (all-wheel drive) switch	3-h-17
Y1	4-Trac (all-wheel drive) solenoid coil	8-q-18
Y91	Auxiliary fuel tank solenoid coil (option)	3-q-16

Measured value table:

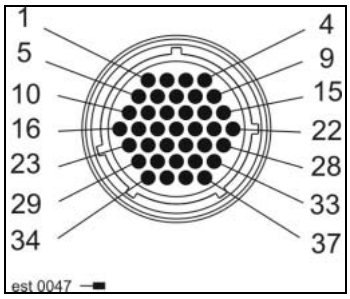
Item	Component	Measured value	Remark
B43	Sensor	12 V Signal 4.75 V 0.25 V	(Pin E-A) (Pin S-A) Tank filling 100% Tank filling 0%
Y1	Solenoid coil	4.0 A 3.0 Ω	See inscription
Y91	Solenoid coil	17 Ω	See inscription

Description of function:

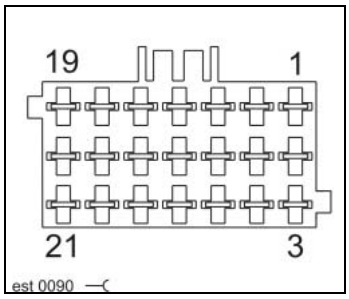
Additional fuel tank	When the diesel engine runs at max. no-load speed and a fuel level of >10% and <70% is identified in the main fuel tank, the fieldwork computer module (A10) actuates the solenoid valve (Y91), making fuel flow from the auxiliary fuel tank into the main fuel tank.

Connector pin definition:

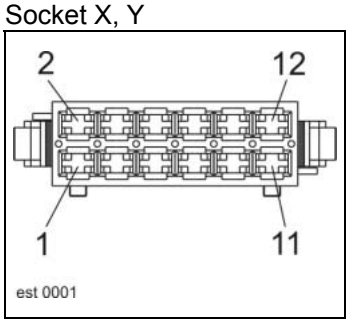
Connector BB



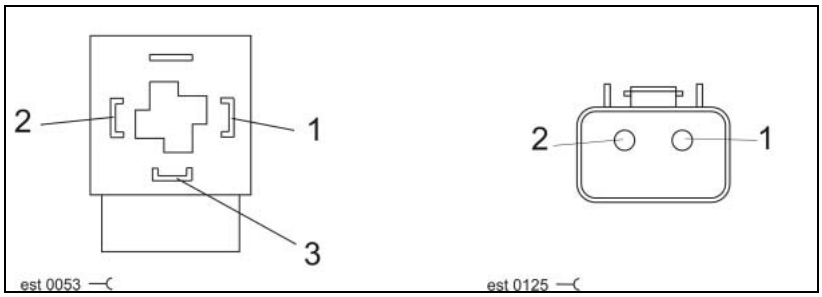
Socket P



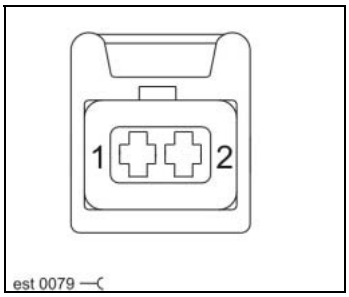
Socket X, Y



Socket Y1



Socket Y91



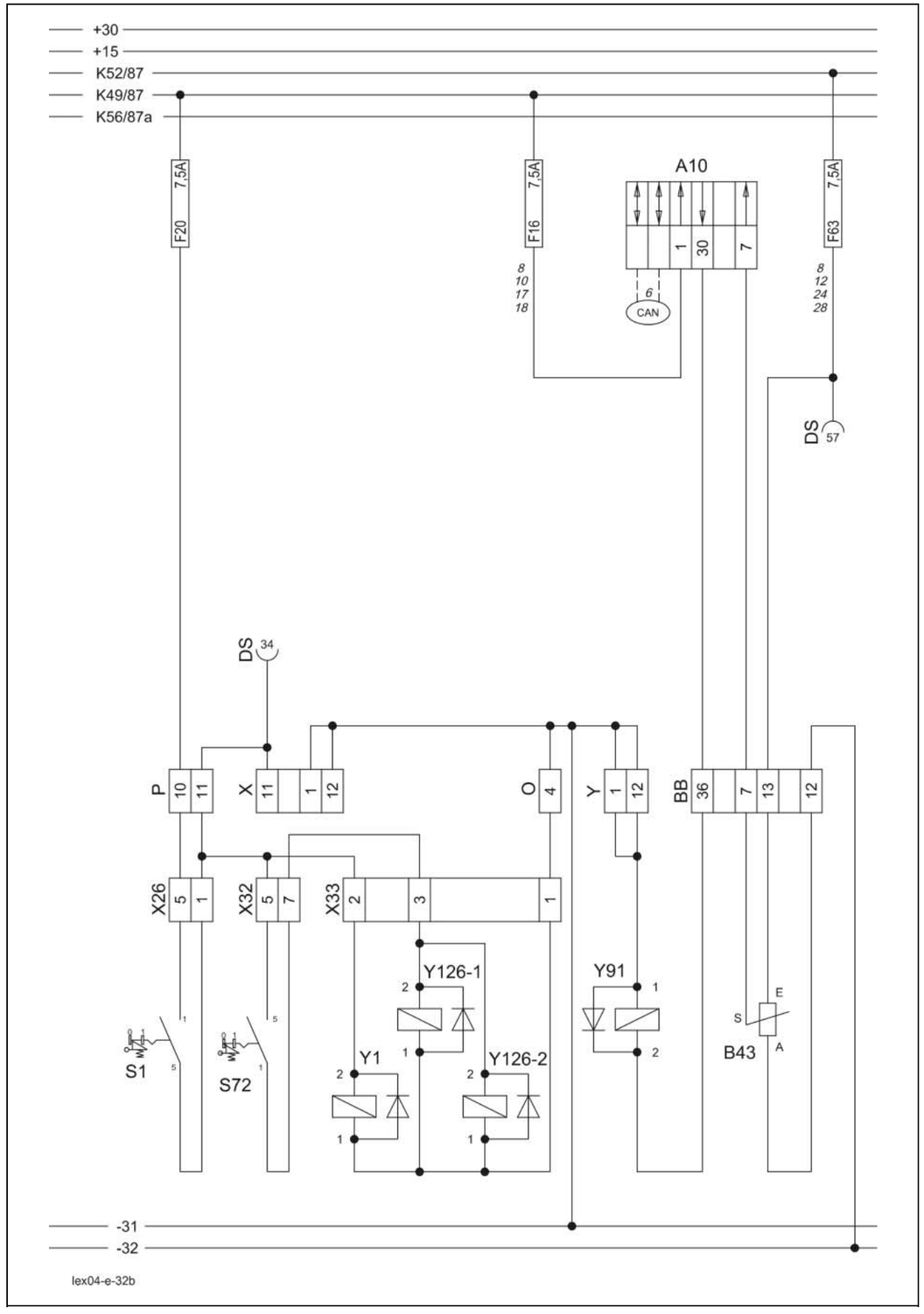
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
BB 7	A10-7					1.0	ye-br
BB 12	A 34	B 33	Q 12	A8 2	A16 2	1.5	bl
	E 37	Bridge a	CB 2	Z 8			
BB 13	MR 5	B 30	MU 8	DS 57	F63 a	1.0	rd-gr
BB 36	A10-30					1.0	gn-or
P 10	F20 a	SL 2				1.5	gn-rd
P 11	X 11	DS 34				1.5	gn-rd
X 1	-31					2.5	br
X 11	P 11	DS 34				1.5	gn-rd
X 12	-31					2.5	br
Y 1	-31					2.5	br
Y 12	-31					2.5	br
Y1-1						1.5	br
Y1-2						1.5	gn-rd
Y91-1						1.5	br
Y91-2						1.0	gn-or

32b

All-wheel drive - overdrive, fuel tank

32b All-wheel drive - overdrive, fuel tank



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
B43	Fuel level sensor	3-q-16
DS	Diagnosis plug (63-pin) VIA	3-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
S1	4-Trac (all-wheel drive) switch	3-h-17
S72	4-Trac overdrive switch	3-h-17
Y1	4-Trac (all-wheel drive) solenoid coil	8-q-18
Y91	Auxiliary fuel tank solenoid coil (option)	3-q-16
Y126-1	4-trac overdrive left solenoid coil	8-q-20
Y126-2	4-trac overdrive right solenoid coil	8-q-16

Measured value table:

Item	Component	Measured value	Remark
B43	Sensor	12 V Signal 4.75 V 0.25 V	(Pin E-A) (Pin S-A) Tank filling 100% Tank filling 0%
Y1 Y126-1 Y126-2	Solenoid coil	4.0 A 3.0 Ω	See inscription
Y91	Solenoid coil	17 Ω	See inscription

Description of function:

Additional fuel tank

When the diesel engine runs at max. no-load speed and a fuel level of >10% and <70% is identified in the main fuel tank, the fieldwork computer module (A10) actuates the solenoid valve (Y91), making fuel flow from the auxiliary fuel tank into the main fuel tank.

All-wheel drive - overdrive

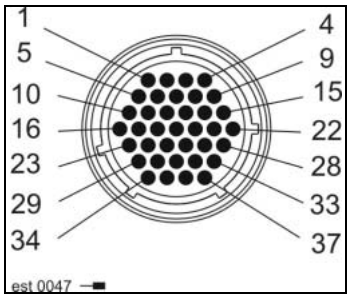
The overdrive circuit allows varying the volume of the 4-trac radial piston motors via the solenoid coils (Y126).

- large volume of 4-trac radial piston motors:
  = low speed
  = high torque.

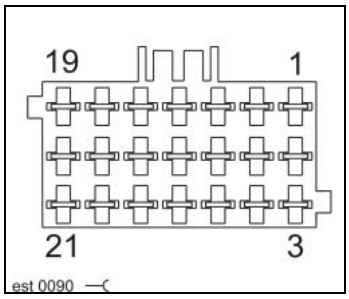
- small volume of 4-trac radial piston motors:
  = high speed
  = low torque.

Connector pin definition:

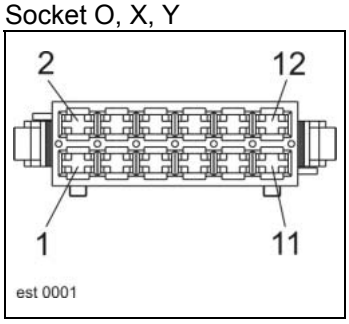
Connector BB



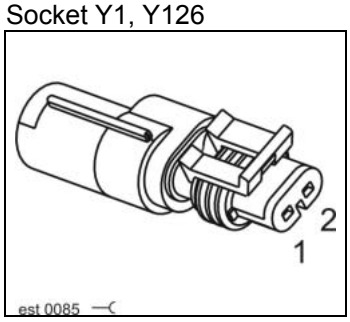
Socket P



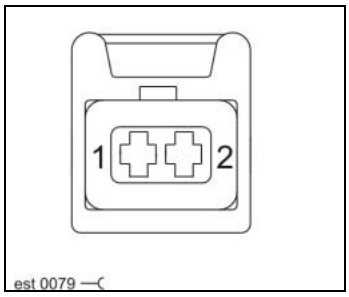
Socket O, X, Y



Socket Y1, Y126



Socket Y91



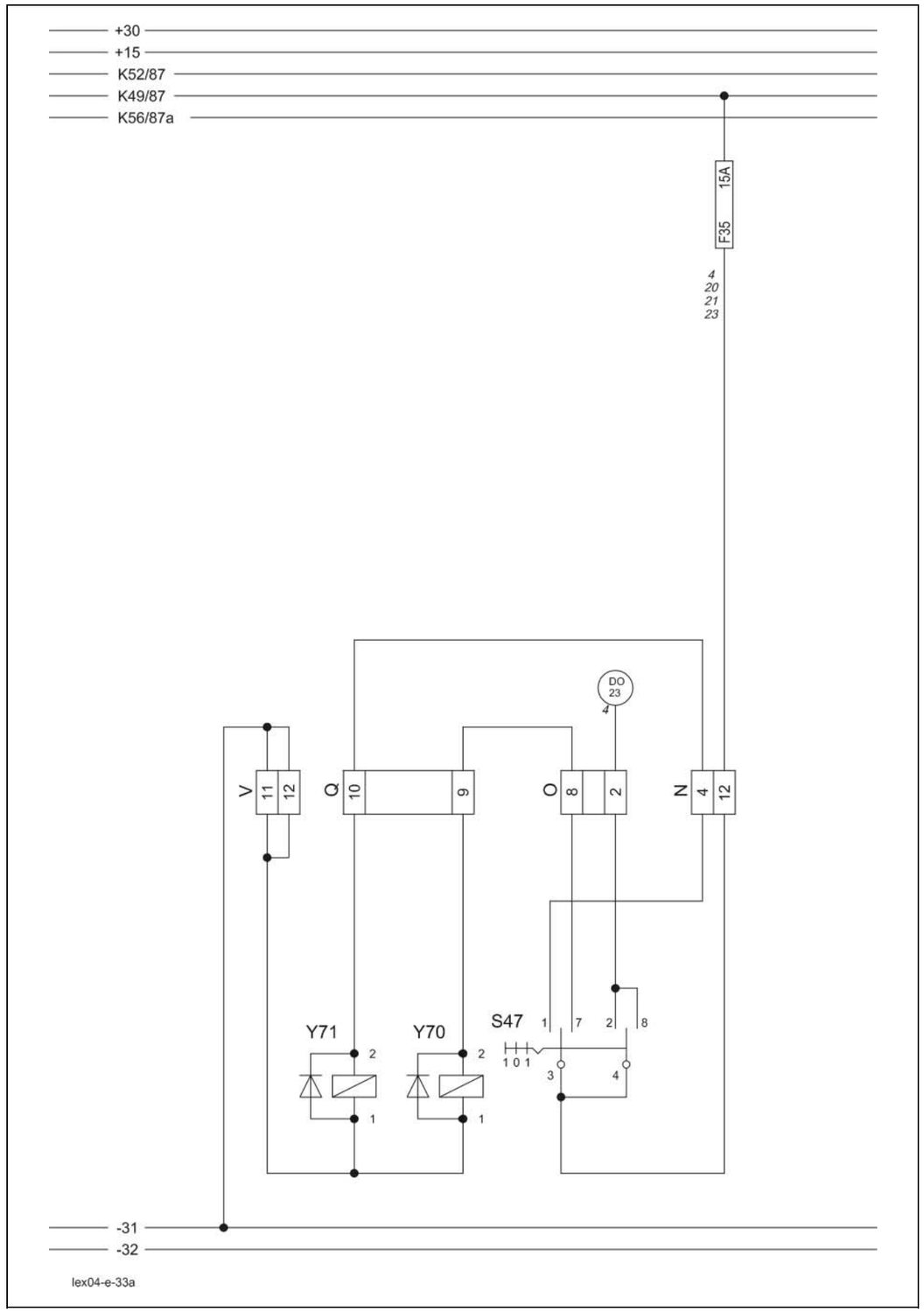
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
BB 7	A10-7					1.0	ye-br
BB 12	A 34	B 33	Q 12	A8 2	A16 2	1.5	bl
	E 37	Bridge a	CB 2	Z 8			
BB 13	MR 5	B 30	MU 8	DS 57	F63 a	1.0	rd-gr
BB 36	A10-30					1.0	gn-or
O 4						2.5	br
P 10	F20 a	SL 2				1.5	gn-rd
P 11	X 11	DS 34				1.5	gn-rd
X 1	-31					2.5	br
X 11	P 11	DS 34				1.5	gn-rd
X 12	-31					2.5	br
X 26-1							
X 26-5							
X32-5							
X32-7							
X33-1						2.5	br
X33-2						1.5	gn-wh
X33-3						1.5	bk-gn
Y 1	-31					2.5	br
Y 12	-31					2.5	br
Y1-1						1.5	br
Y1-2						1.5	gn-rd
Y91-1						1.5	br
Y91-2						1.0	gn-or

33a

Cutterbar spring lock

33a Cutterbar spring lock



Key to diagram:

		Coordinates
DO	Master valve diode PCB	4-i-20
K49	Road travel main relay	4-i-20
S47	Cutterbar spring lock switch	3-h-17
Y70	Cutterbar spring unlock solenoid coil	5-m-20
Y71	Cutterbar spring lock solenoid coil	5-m-20

Measured value table:

Item	Component	Measured value	Remark
Y70 Y71	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

Spring lock

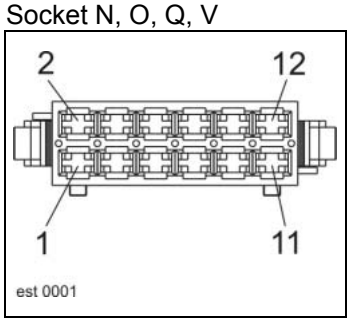
The spring lock can only be actuated when the road travel circuit relay K49 is unlocked.

When actuated, the cutterbar spring lock switch (S47) supplies the respective solenoid coil (Y70/Y71) with power.

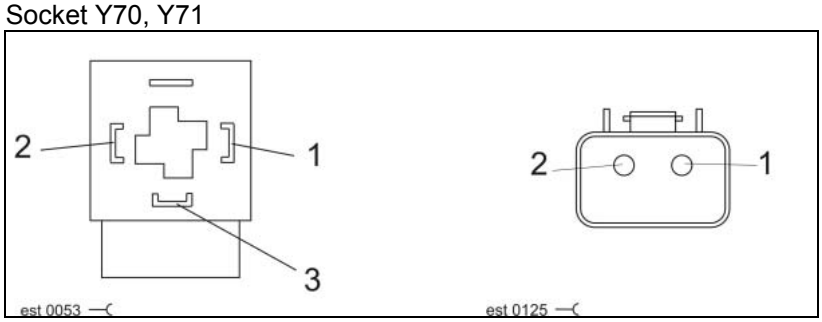
The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils (Y70/Y71) because this function requires that pressure is built up in the system.

Connector pin definition:

Socket N, O, Q, V



Socket Y70, Y71



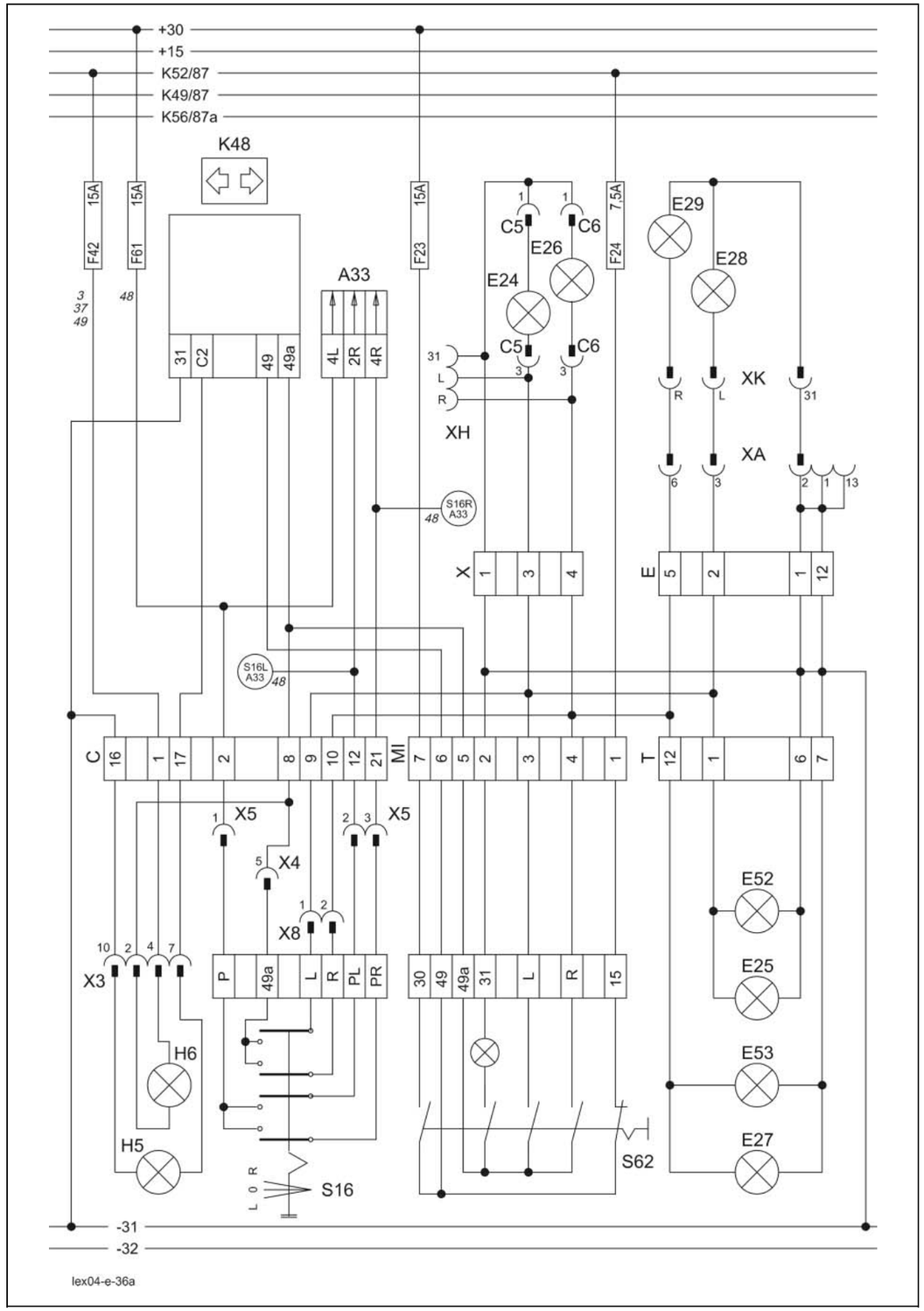
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
N4	Q 10					1.5	br-gn
N12	F35 a	U 7	K5 86	K5 30	K6 86	2.5	bk-ye
	K6 30	K7 86	K7 30	K8 86	K8 30		
	A8 20						
O2	DO 23					0.5	gn-bl
O8	Q 9					1.5	wh-bl
Q9	O 8					1.5	bk-bl
Q10	N					1.5	bk-rd
V11	-31					2.5	br
V12	-31					2.5	br
Y70-1						1.5	br
Y70-2						1.5	bk-bl
Y71-1						1.5	br
Y71-2						1.0	bk-rd

36a

Indicator system (Europe)

36a Indicator system (Europe)



Key to diagram:

		Coordinates
A33	Sidefinder module	4-i-20
C3	Control stalk with parking light	4-g-18
C5	Taillight, left-hand	5-u-21
C6	Taillight, right-hand	5-u-15
E24	Indicator, rear left	5-u-21
E25	Indicator, front left	5-g-20
E26	Indicator, rear right	5-u-15
E27	Indicator, front right	5-g-16
E28	Indicator, front attachment left	7-d-21
E29	Indicator, front attachment right	7-d-21
E52	Indicator, side left	5-h-20
E53	Indicator, side right	5-h-16
H5	Trailer indicator signal light	4-g-18
H6	Vehicle indicator signal light	4-g-18
K48	Indicator relay	4-i-20
K52	Power supply relay	4-i-20
S16	Indicator switch	3-g-18
S62	Hazard warning flasher switch	3-h-17
X4	Steering column indicator lights connector	4-g-18
XA	Multifunction coupling A connector	8-f-20
XH	Trailer lighting connector	7-r-18
XK	Front attachment lighting connector	7-d-18

Measured value table:

Item	Component	Measured value	Remark
K48	Indicator relay	---	Electronic relay

Description of function:

Sidefinder function:

Additional lights (sidefinder) are available as an accessory for better lateral lighting during threshing.

When actuating the indicator switch (S16), a signal input is connected to the sidefinder module (A33) in parallel.

With the threshing mechanism **activated** (K14 - circuit diagram 7a) and the lighting switched on by the vehicle lighting main switch (S17 -), the sidefinders (E71/E72) can now be switched on and off using the indicator switches (S16).

As soon as the vehicle lighting main switch (S17) signal or the threshing mechanism ON (K14) signal is missing, the sidefinders are switched off.

Pathfinder function:

Activation of the pathfinder function using the indicator switch (S16):

- The function is possible only when the machine is at standstill (lights off, threshing mechanism off, ignition off).
- Actuate the indicator switch (S16).
- The pathfinder function is started by means of the headlight flasher (wake up) and it does not matter if the indicator switch (S16) has been actuated to the left or to the right.

The pathfinder function is activated by the vehicle lighting main switch (S17):

- Threshing mechanism off
- Ignition off
- Lighting off
- Repeatedly switching on/off the lighting re-starts the pathfinder function (up to 15 min. max until ignition off)
- Both sidefinders plus headlights are switched on simultaneously.

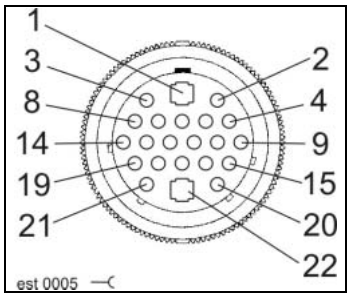
Until 1 minute has expired or until the indicator or the lighting has been actuated again, the module shuts down all outputs and then it shuts down itself.

Note:

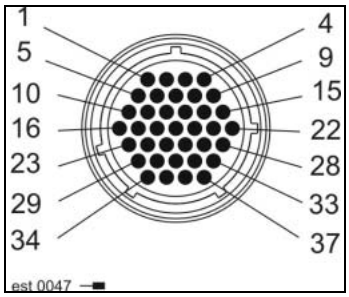
- Indicator switch (S16) → circuit diagram 36
- Vehicle lighting main switch (S17) → circuit diagram 45
- Pathfinder lighting → circuit diagram 47, 48
- Sidefinder lighting → circuit diagram 48

Connector pin definition:

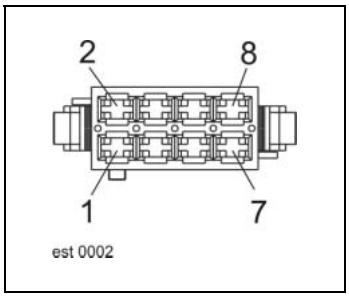
Socket C



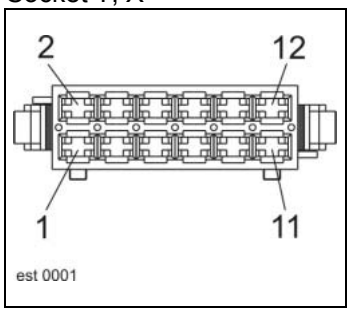
Connector E



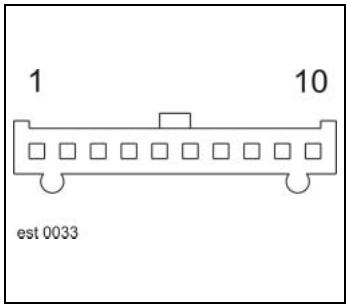
Socket MI



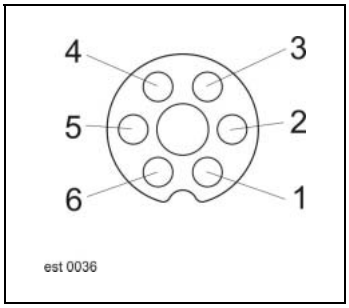
Socket T, X



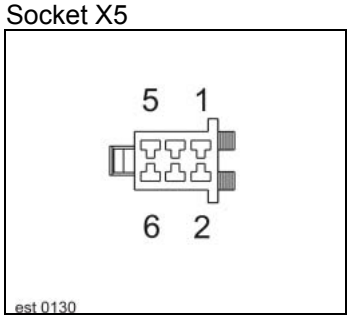
Socket X3



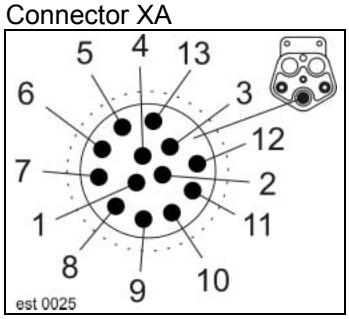
Socket X4



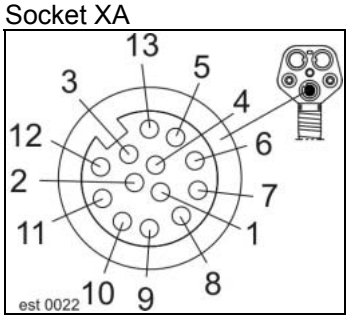
Socket X5



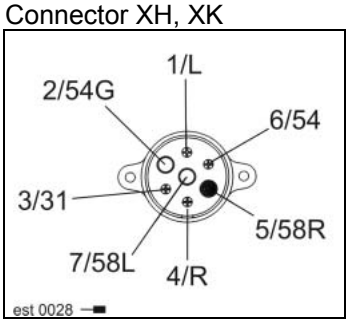
Connector XA



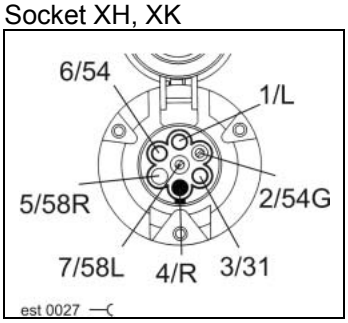
Socket XA



Connector XH, XK



Socket XH, XK



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C1	F42a					1.5	bk
C2	F61 a	A33 4L				0.5	br-vi
C8	MI 5	K48 49a	K47 1	K47 2		1.5	rd-ye
C9	E 2	T 1	X 3	K47 5	MI 3	1.5	bk-wh
C10	MI 4	T 12	E 5	X 4	K47 7	1.5	bk-gn
C12	A33 2R					0.5	vi-rd
C16	-31					1.5	br
C17	K48 C2	K47 3	K47 6			0.35	bl-wh
C21	A33 4R					0.5	vi-gr
E1	-31					1.5	br
E2	MI 3	C 9	T 1	X 3	K47 5	1.5	bk-wh
E5	MI 4	T 12	C 10	X 4	K47 7	1.5	bk-gn
E12	-31					1.5	br
MI1	F24 a					1.5	bk-or
MI2	-31					2.5	br
MI3	C 9	E 2	T 1	X 3	K47 5	1.5	bk-wh
MI4	T 12	E 5	C 10	X 4	K47 7	1.5	bk-gn
MI5	K48 49a	C 8	K47 1	K47 2		1.5	wh-gn
MI6	K48 49					1.5	bk-gr
MI7	F23 a					2.5	rd
T1	MI 3	C 9	E 2	X 3	K47 5	1.5	bk-wh
T6	-31					1.5	br
T7	-31					1.5	br
T12	MI 4	E 5	C 10	X 4	K47 7	1.5	bk-gn
X-1	-31					2.5	br
X-3	MI 3	C 9	E 2	T 1	X 3	1.5	bk-wh
X-4	MI 4	T 12	E 5	C 10	X 4	1.5	bk-gn

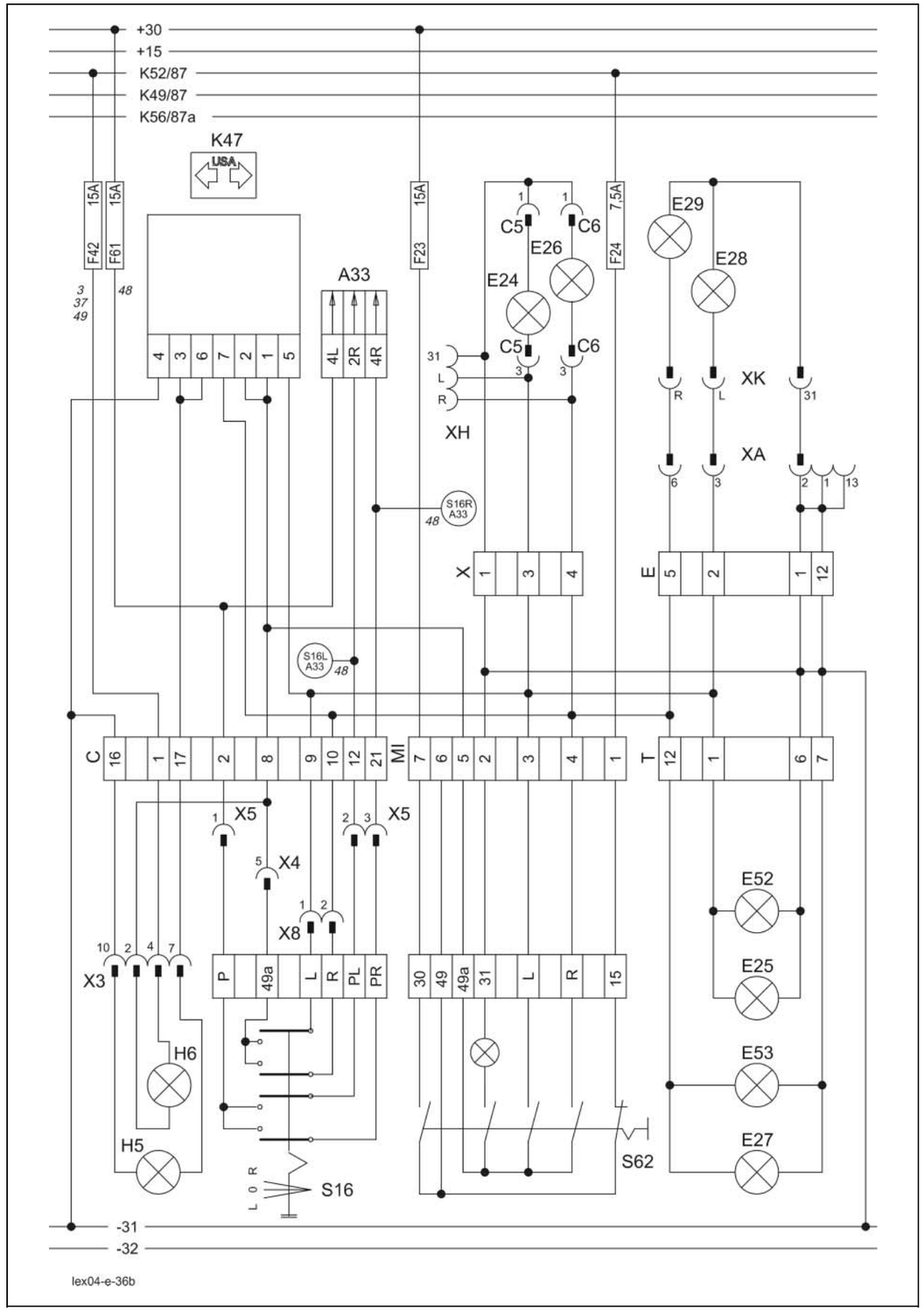
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X3-2						0.35	gn-or
X3-4						0.5	bk
X3-7						0.35	bl-wh
X3-10						0.35	br
X4-5						1.5	gn-or
X5-1						0.5	rd
X5-2						0.5	vi-rd
X5-3						0.5	bl-br
X8-1						1.5	bk-wh
X8-2						1.5	bk-gn
XA-1						1.5	br
XA-2						1.5	br
XA-13						1.5	br
XA-3						1.5	bk-wh
XA-6						1.5	bk-gn

36b

Indicator system (USA)

36b Indicator system (USA)



Key to diagram: Coordinates

A33	Sidefinder module	4-i-20
C3	Control stalk with parking light	4-g-18
C5	Taillight, left-hand	5-u-21
C6	Taillight, right-hand	5-u-15
E24	Indicator, rear left	5-u-21
E25	Indicator, front left	5-g-20
E26	Indicator, rear right	5-u-15
E27	Indicator, front right	5-g-16
E28	Indicator, front attachment left	7-d-21
E29	Indicator, front attachment right	7-d-21
E52	Indicator, side left	5-h-20
E53	Indicator, side right	5-h-16
H5	Trailer indicator signal light	4-g-18
H6	Vehicle indicator signal light	4-g-18
K47	Flash relay	4-i-20
K52	Power supply relay	4-i-20
S16	Indicator switch	3-g-18
S62	Hazard warning flasher switch	3-h-17
X3	Steering column indicator lights connector	4-g-18
XA	Multifunction coupling A connector	8-f-20
XH	Trailer lighting connector	7-r-18
XK	Front attachment lighting connector	7-d-18

Measured value table:

Item	Component	Measured value	Remark
K47	Flash relay	---	Electronic relay

Description of function:

Sidefinder function:

Additional lights (sidefinder) are available as an accessory for better lateral lighting during threshing – circuit diagram 48a.

When actuating the indicator switch (S16), a signal input is connected to the sidefinder module (A33) in parallel.

With the threshing mechanism **activated** (K14 – circuit diagram 7a) and the lighting switched on by the vehicle lighting main switch (S17 – circuit diagram 45a), the sidefinders (E71/E72) can now be switched on and off using the indicator switches (S16) – circuit diagram 48a.

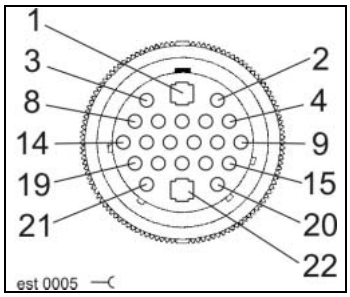
As soon as the vehicle lighting main switch (S17) signal or the threshing mechanism ON (K14) signal is missing, the sidefinders are switched off.

Pathfinder function:

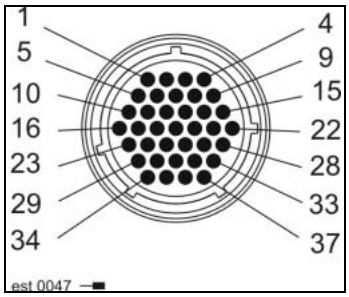
When actuating the indicator switch (S16) with the machine at standstill (ignition off), the worklights light up for approx. 3 min.

Connector pin definition:

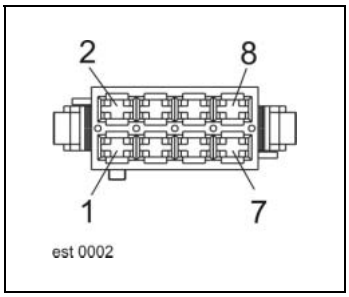
Socket C



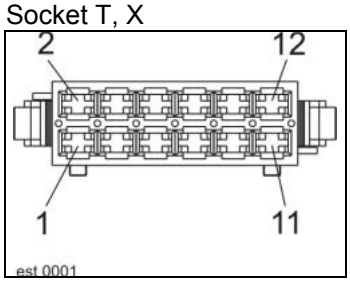
Connector E



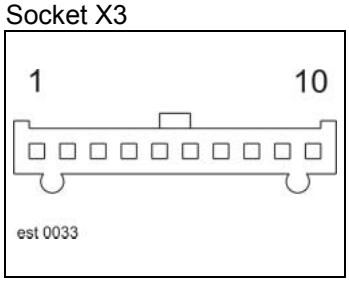
Socket MI



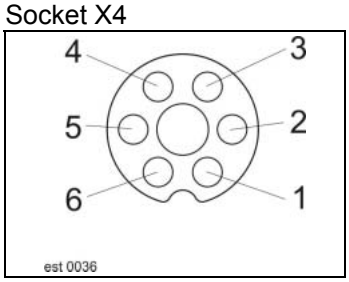
Socket T, X



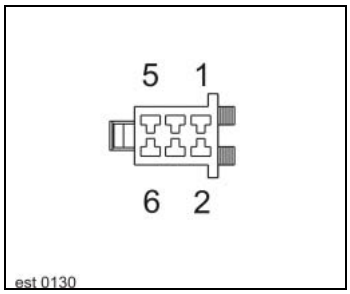
Socket X3



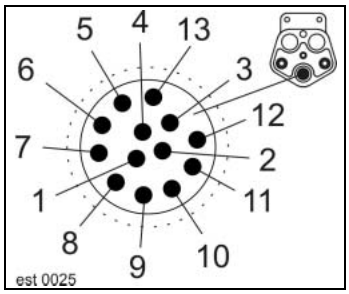
Socket X4



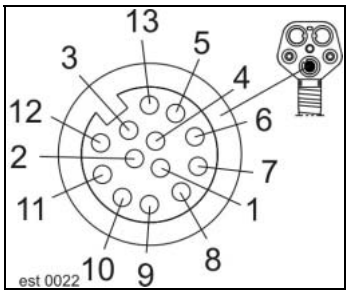
Socket X5



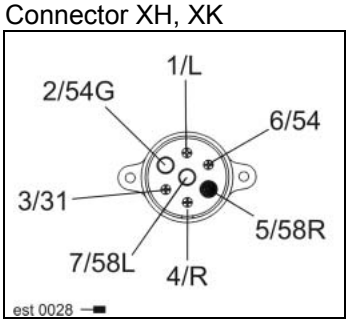
Connector XA



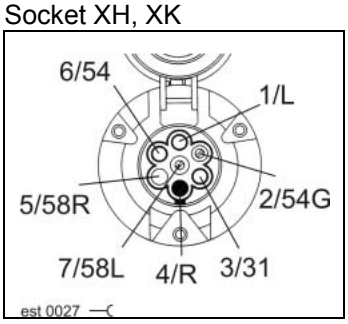
Socket XA



Connector XH, XK



Socket XH, XK



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C1	F42a					1.5	bk
C2	F61 a	A33 4L				0.5	br-vi
C8	MI 5	K48 49a	K47 1	K47 2		1.5	rd-ye
C9	E 2	T 1	X 3	K47 5	MI 3	1.5	bk-wh
C10	MI 4	T 12	E 5	X 4	K47 7	1.5	bk-gn
C12	A33 2R					0.5	vi-rd
C16	-31					1.5	br
C17	K48 C2	K47 3	K47 6			0.35	bl-wh
C21	A33 4R					0.5	vi-gr
E1	-31					1.5	br
E2	MI 3	C 9	T 1	X 3	K47 5	1.5	bk-wh
E5	MI 4	T 12	C 10	X 4	K47 7	1.5	bk-gn
E12	-31					1.5	br
MI1	F24 a					1.5	bk-or
MI2	-31					2.5	br
MI3	C 9	E 2	T 1	X 3	K47 5	1.5	bk-wh
MI4	T 12	E 5	C 10	X 4	K47 7	1.5	bk-gn
MI5	K48 49a	C 8	K47 1	K47 2		1.5	wh-gn
MI6	K48 49					1.5	bk-gr
MI7	F23 a					2.5	rd
T1	MI 3	C 9	E 2	X 3	K47 5	1.5	bk-wh
T6	-31					1.5	br
T7	-31					1.5	br
T12	MI 4	E 5	C 10	X 4	K47 7	1.5	bk-gn
X-1	-31					2.5	br
X-3	MI 3	C 9	E 2	T 1	X 3	1.5	bk-wh
X-4	MI 4	T 12	E 5	C 10	X 4	1.5	bk-gn

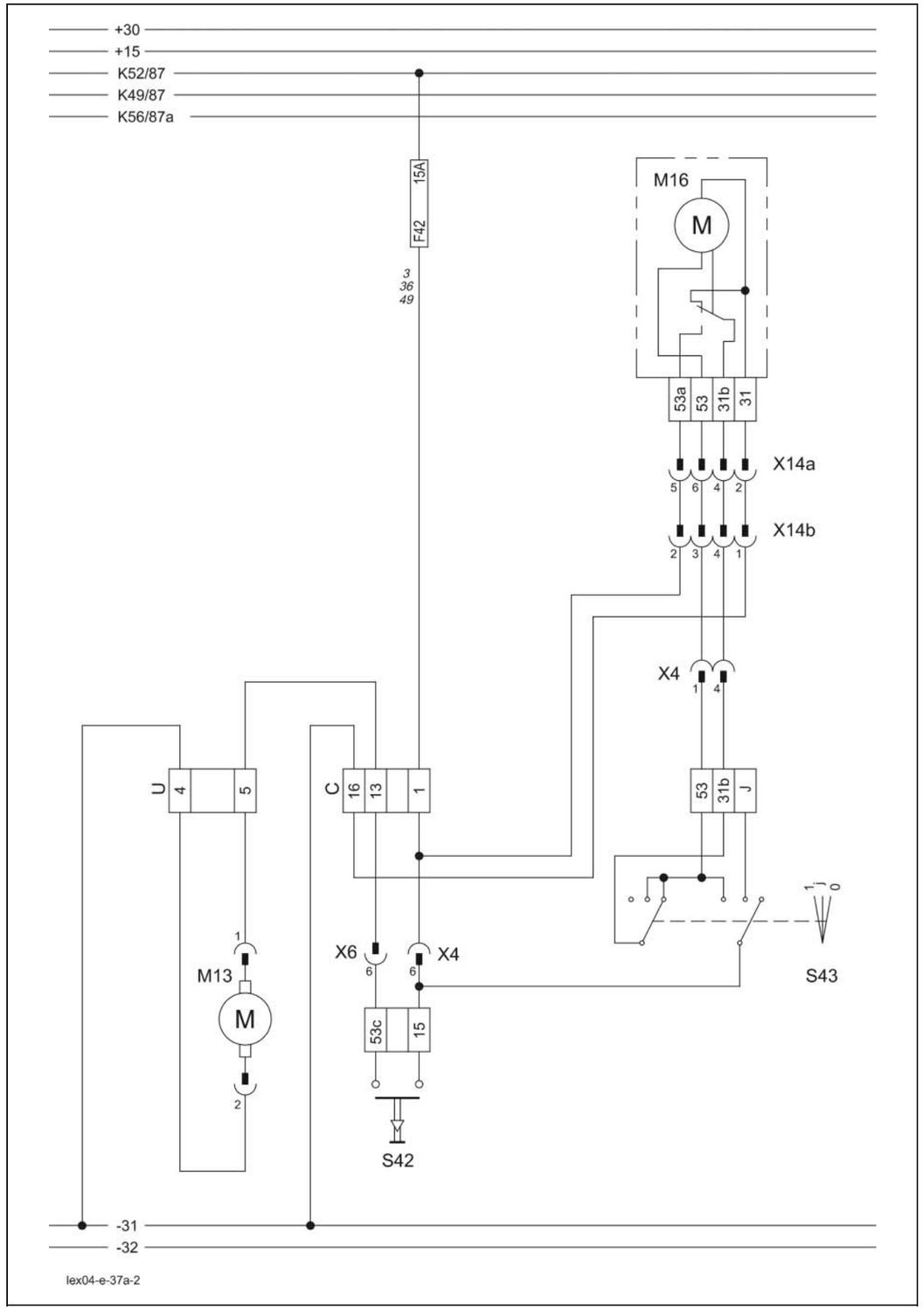
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
X3-2						0.35	gn-or
X3-4						0.5	bk
X3-7						0.35	bl-wh
X3-10						0.35	br
X4-5						1.5	gn-or
X5-1						0.5	rd
X5-2						0.5	vi-rd
X5-3						0.5	bl-br
X8-1						1.5	bk-wh
X8-2						1.5	bk-gn
XA-1						1.5	br
XA-2						1.5	br
XA-13						1.5	br
XA-3						1.5	bk-wh
XA-6						1.5	bk-gn

37a

Windscreen wiper, windscreen washer

37a Windscreen wiper, windscreen washer



Key to diagram:

Coordinates

C3	Control stalk with parking light	4-g-18
K52	Power supply relay	4-i-20
M13	Windscreen washer motor, front	5-f-16
M16	Windscreen wiper motor, front	4-g-18
S42	Windscreen washer switch	4-g-18
S43	Windscreen wiper switch	4-g-18
X14a	Windscreen wiper connector	4-g-18
X14b	Windscreen wiper connector	4-g-18

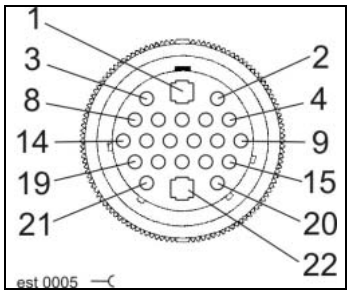
Measured value table:

Item	Component	Measured value	Remark
M16	Electric motor	8.5 A	max. current

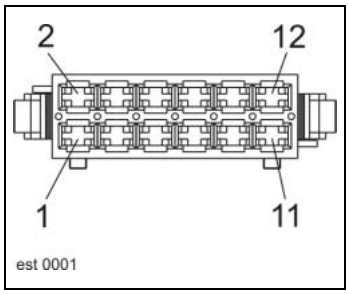
Description of function: None

Connector pin definition:

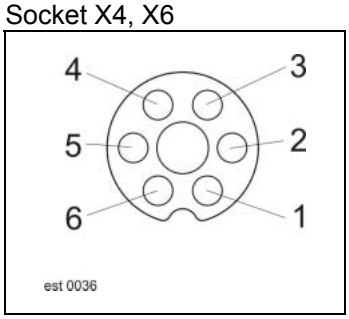
Socket C



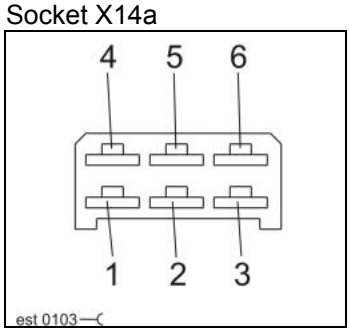
Socket U



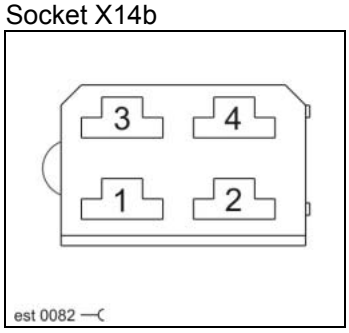
Socket X4, X6



Socket X14a



Socket X14b



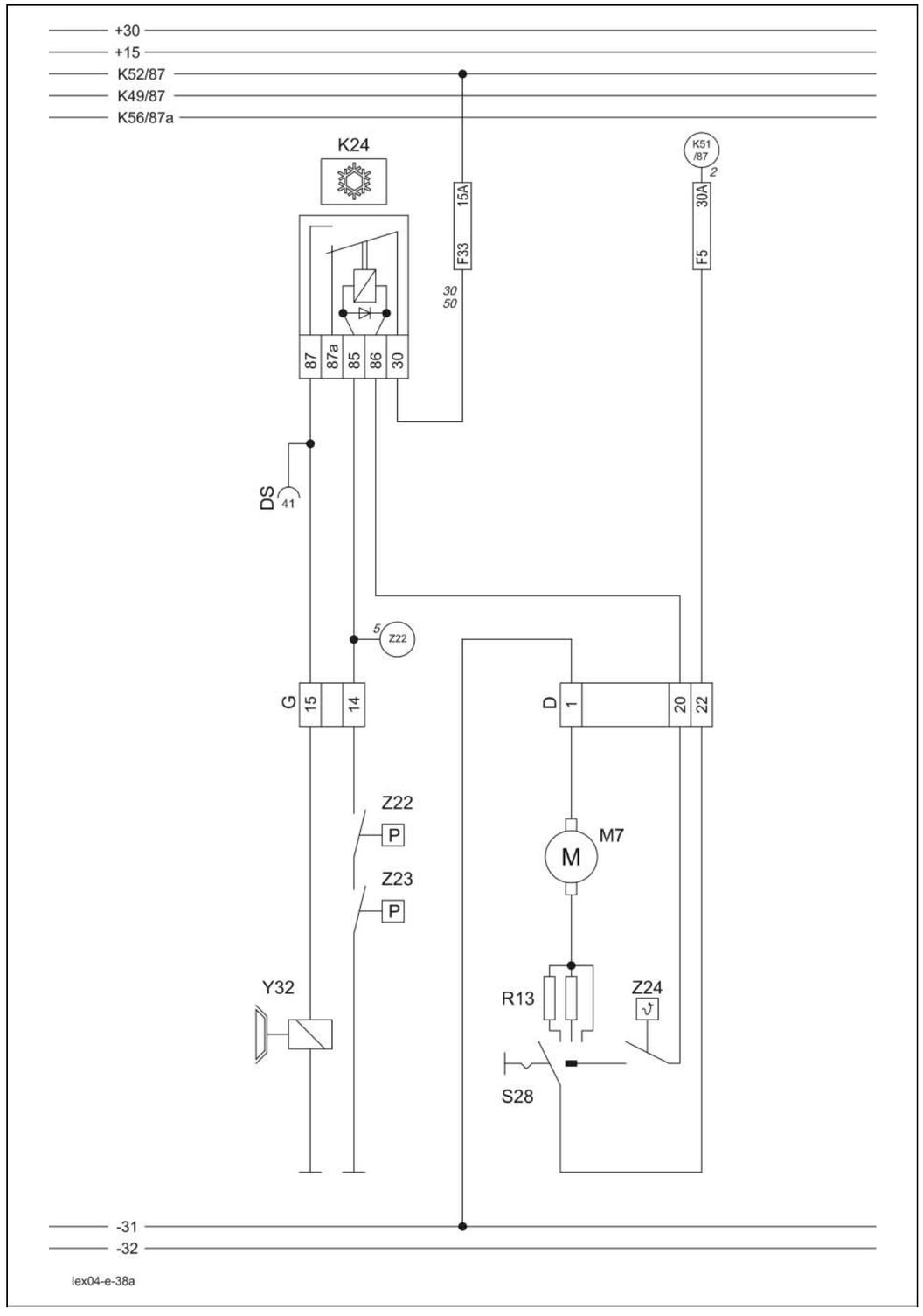
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C 1	F42a					1.5	bk
C 13	U 5					1.5	vi
C 16	-31					1.5	br
U 4	-31					2.5	br
U 5	C 13					1.5	vi-ye
X4-1						1.5	pi
X4-4						1.5	gn-ye
X4-6						1.5	bk
X6-6						1.5	vi
X14b-1						1.5	br
X14b-2						0.75	bk
X14b-3						1.5	pi
X14b-4						1.5	gn-ye

38a

Compressor-type air conditioner

38a Compressor-type air conditioner



Key to diagram:

Coordinates

DS	Diagnosis plug (63-pin) VIA	3-i-20
K24	Compressor-type air conditioner relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
M7	Cab fan motor	2-g-18
R13	Cab fan series resistor potentiometer	2-g-18
S28	Cab fan switch	2-g-18
Z22	Compressor-type air conditioner high pressure actual value switch	2-n-17
Z23	Compressor-type air conditioner low pressure actual value switch	2-n-17
Z24	Compressor-type air conditioner temperature actual value switch	2-g-18
Y32	Compressor-type air conditioner electro-magnetic clutch solenoid coil	2-p-17

Measured value table:

Item	Component	Measured value	Remark
K24	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)

Description of function:

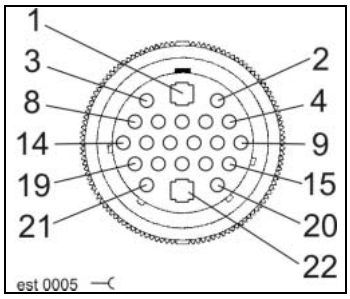
Compressor-type air conditioner

The two closed gas-pressure switches (Z22/Z23) must supply relay K24 with earth in order to allow the function of the electro-magnetic clutch (Y32). When the fan switch (S28) and the thermostat switch (Z24) are closed, relay K24 is actuated and thus, electro-magnetic clutch (Y32) is also supplied with power by relay K52/87.

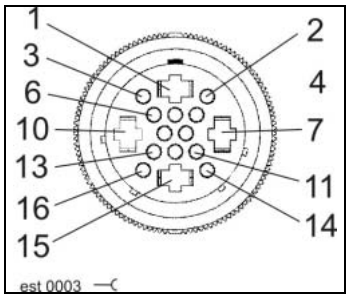
If the earth signal fails due to one of the two gas-pressure switches (Z22/Z23), the electro-magnetic clutch (Y32) disengages and this fault is displayed in terminal (A30).

Connector pin definition:

Socket D



Socket G



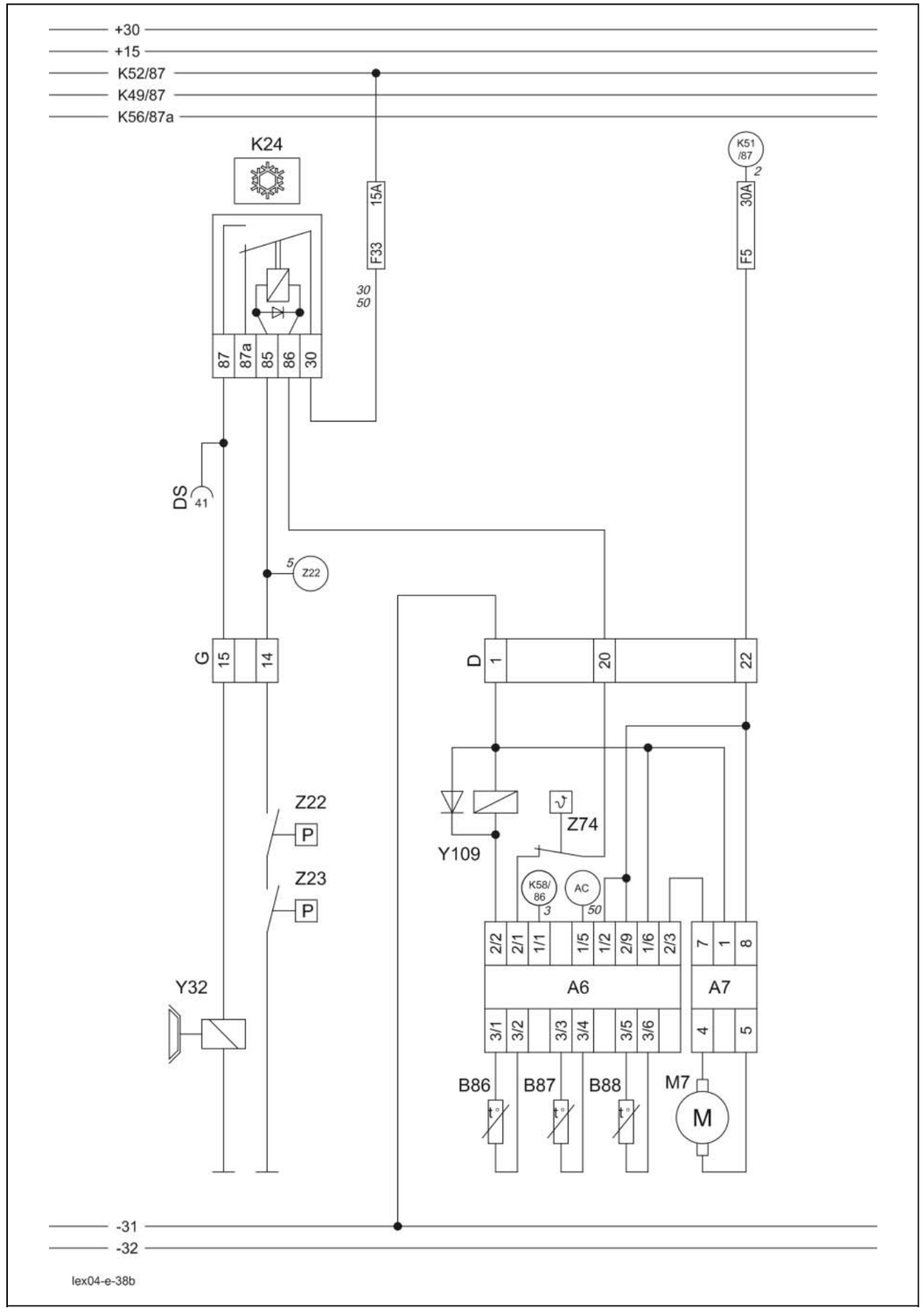
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
D 20	K24 86					1.5	rd-gn
D 22	F05 a					4.0	bk
G 14	A 6	K24 85				1.0	gn-v
G 15	K24 87	DS 41				1.5	bk-gn

38b

Automatic air conditioner

38b Automatic air conditioner



Key to diagram:

		Coordinates
AC	Automatic air conditioner instrument lighting	2-g-18
A6	Automatic air conditioner module	2-g-18
A7	Cab fan speed controller module	2-g-18
B86	AC cab temperature sensor	2-h-17
B87	AC air discharge temperature sensor	2-g-18
B88	AC outside temperature sensor	2-h-19
DS	Diagnosis plug (63-pin) VIA	3-i-20
K24	Compressor-type air conditioner relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
K58	Alternator time relay	4-i-20
M7	Cab fan motor	2-g-18
Y32	Compressor-type air conditioner electro-magnetic clutch solenoid coil	2-p-17
Y109	Heater solenoid coil	2-h-19
Z22	Compressor-type air conditioner high pressure actual value switch	2-n-17
Z23	Compressor-type air conditioner low pressure actual value switch	2-n-17
Z74	Anti-icing device actual value switch	2-g-18

Measured value table:

Item	Component	Measured value	Remark
B86	Cab temperature sensor	20° - 97070 Ω -10° - 55330 Ω 0° - 32650 Ω	blue; fault by flashing code in display
B87	Air discharge temperature sensor	10° - 19900 Ω 20° - 12490 Ω 30° - 8057 Ω	yellow; fault by flashing code in display
B88	Outside temperature sensor	40° - 5327 Ω 50° - 3603 Ω 60° - 2488 Ω	red; fault by flashing code in display
K68 K75	Remote control relay	85±7 Ω 20A 40A	(Pin 85 - Pin 86) (Pin 30 - Pin 87a) (Pin 30 - Pin 87)
Y32	Solenoid coil	3.0 A 4.0 Ω	
Y109	Solenoid coil	0.8 A 15 Ω	Messrs. Konvekta

Description of function: 1/7

Automatic air conditioner

Together with the cab fan speed controller module (A7), the automatic air conditioner module (A6) provides the complete temperature control inside the cab.
This involves both actuating the cooling compressor electro-magnetic clutch (Y32) via relay K24 and switching the heater circuit on and off if required via solenoid coil (Y109) until the set values agree with the actual values of the corresponding sensors.
The two closed gas-pressure switches (Z22/Z23) must supply relay K24 with earth in order to allow the function of the electro-magnetic clutch (Y32).
The temperature switch (Z74) prevents icing on the evaporator.
If the earth signal fails due to one of the two gas-pressure switches (Z22/Z23), the electro-magnetic clutch (Y32) disengages and this fault is displayed in terminal (A30).

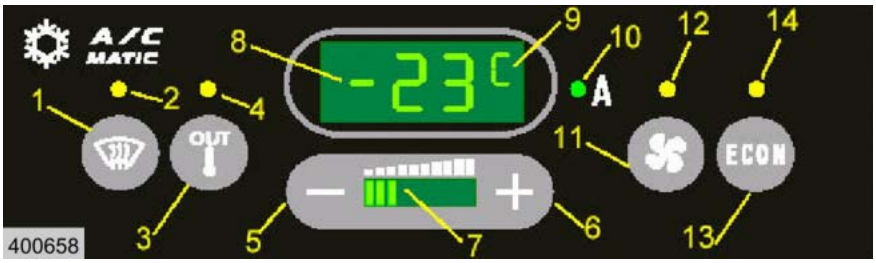
econ operation

In this operating mode, the cooling compressor is not activated. The entire air conditioner control is realised by the heater and the fan.

REHEAT function

In this operating mode, the cooling compressor is permanently activated. The ambient sensors (e.g. outside temperature sensor) is not considered here.
Activation is for a defined period of time (see also Operator's Manual).

Test menu:



Key to diagram:

1	Key for activating the test menu
2	LED (without function in the test menu)
3	Key for activating the test menu
4	LED (without function in the test menu)
5	Key (without function in the test menu)
6	Key (without function in the test menu)
7	LED bar display indicates the evaporator fan speed
8	Display field (3 digits) Indicates the temperature in the test menu.
9	Display (1 digit). Indicates the measuring points in the test menu.
10	LED (without function in the test menu)
11	Key for leaving the test menu. A RESET is carried out after confirmation.
12	LED (without function in the test menu)
13	Key for activating the test menu
	LED (without function in the test menu)

Description of function: 2/7

- Test menu operation

1. Switch on the ignition and start the engine.

2. Display of software version

The software version is displayed for 3 seconds.
If the software version flashes, the factory setting of the software in the automatic air conditioner module (A6) was modified.

3. Temperature display

- Test menu access

1. Press key (3) and release it.

2. Press key (1) and hold it.

3. Press keys (11) and (13) simultaneously.

4. Release keys (1), (11) and (13) simultaneously.

The display field (8) shows the total of the factory software setting values = 370.
If the setting value flashes, the factory software setting values in the automatic air conditioner module (A6) were modified.

1st menu item

Press key (3) once.
The cab temperature in °C is displayed.

Cab temperature

Example: 25.5°C

If the temperature display is incorrect, please check the following:

1. Position and possibly soiling of AC cab temperature sensor (B86), (on the rear right, behind the suction lamellas).
2. Connector on the automatic air conditioner module (A6).
3. Measure the resistance of the AC cab temperature sensor (B86), must be 10kOhm at 25°C.
4. Offset value of AC cab temperature sensor (B86) in the controller menu.

Description of function: 3/7

2nd menu item

Blow-out temperature

Press key (3) once.
The blow-out temperature in °C is displayed.

Example: 29.3°C

If the temperature display is incorrect, please check the following:

1. Position and possibly soiling of the AC blow-out temperature sensor (B87), (behind the large blow-out nozzle, top left).
2. Connector on the automatic air conditioner module (A6).
3. Measure the resistance of the AC blow-out temperature sensor (B87), must be 10kOhm at 25°C.
4. Offset value of AC blow-out temperature sensor (B87) in the controller menu.

3rd menu item

Outside temperature

Press key (3) once.
The outside temperature in °C is displayed.

Example: 21.1°C

If the temperature display is incorrect, please check the following:

1. Position and possibly soiling of AC outside temperature sensor (B88), (top left, below the roof cover, behind the fresh air filter).
2. Connector on the automatic air conditioner module (A6).
3. Measure the resistance of the AC outside temperature sensor (B88), must be 10kOhm at 25°C.
4. Offset value of AC outside temperature sensor (B88) in the controller menu.

4th menu item

Heater solenoid coil (Y109)

Press key (3) once.
The heater solenoid coil (Y109) is switched on.

Example: Test step 4 is displayed

If the solenoid coil is not activated, please check the following:

1. Connector on the heater solenoid coil (Y109)
   (top right, below the roof cover).
2. Voltage at the solenoid coil of 11.5 – 14.5 V, with the output activated. The solenoid coil must be connected.
3. Connector on the automatic air conditioner module (A6).
4. Check for short-circuit or break in the cable on the heater solenoid coil (Y109).

Description of function: 4/7

Important note:

The further test steps (menu items) can be carried out only when a voltage is applied to pin 1/1 of the automatic air conditioner module (A6).

5th menu item

Compressor-type air conditioner electro-magnetic clutch solenoid coil Y32

Press key (3) once.
The compressor-type air conditioner electro-magnetic clutch solenoid coil (Y32) is activated.

Example: Test step 5 is displayed

If the electro-magnetic clutch (Y32) is not activated, please check the following:

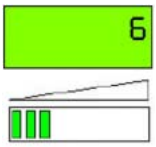
1. Connector on the compressor.
2. Fuse (F33, 1.5A) and compressor-type air conditioner relay (K24)
3. Check electro-magnetic clutch mechanically
4. Connector on the automatic air conditioner module (A6).
5. Check for short-circuit or break in the cable on the compressor-type air conditioner solenoid coil electro-magnetic clutch (Y32).

The solenoid is deactivated again when selecting the next menu item.

6th menu item

Fan speed (30%)
Cab fan (M7)

Press key (3) once.
The fan speed (30%) of the cab fan (M7) is activated.



Example: Test step 6 is displayed

The speed is displayed as a bar display.

If the cab fan does not start, please check the following:

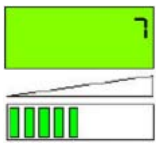
1. Connector on the evaporator fan below the roof cover. Slacken off the cover screws and remove the cover.
2. Check the cab fan motor mechanically. Abraded particles of carbon brushes.
3. Connector on the automatic air conditioner module (A6).
4. Fuse (F33, 1.5A)
5. Check cable to the cab fan motor (M7) for short-circuit or break.

Description of function: 5/7

7th menu item

Fan speed (50%)
Cab fan (M7)

Press key (3) once.
The fan speed (50%) of the cab fan (M7) is activated.



Example: Test step 7 is displayed

The speed is displayed as a bar display.

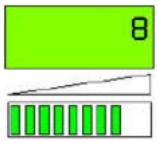
If the cab fan does not start, please check the following:

1. Connector on the cab fan (below the roof cover).
2. Check the cab fan motor mechanically. Abraded particles of carbon brushes
3. Connector on the automatic air conditioner module (A6).
4. Fuse (F33, 1.5A)
5. Check cable to the cab fan motor (M7) for short-circuit or break.

8th menu item

Fan speed (80%)
Cab fan (M7)

Press key (3) once.
The fan speed (80%) of the cab fan (M7) is activated.



Example: Test step 8 is displayed

The speed is displayed as a bar display.

If the cab fan does not start, please check the following:

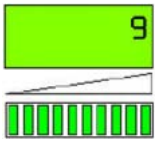
1. Connector on the cab fan (below the roof cover).
2. Check the cab fan motor mechanically. Abraded particles of carbon brushes
3. Connector on the automatic air conditioner module (A6).
4. Fuse (F33, 1.5A)
5. Check cable to the cab fan motor (M7) for short-circuit or break.

Description of function: 6/7

9th menu item

Fan speed (100%)
Cab fan (M7)

Press key (3) once.
The fan speed (100%) of the cab fan (M7) is activated.



Example: Test step 9 is displayed

The speed is displayed as a bar display.

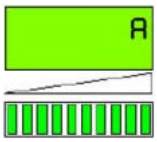
If the cab fan does not start, please check the following:

1. Connector on the cab fan (below the roof cover).
2. Cab fan speed controller module (A7) below the roof cover. Slacken off the cover screws and remove the cover.
3. Voltage on the cab fan motor. Target value: 11.5 – 14.5 V. The cab fan speed controller module (A7) must be connected.
4. Check the cab fan motor mechanically. Abraded particles of carbon brushes
5. Connector on the cab fan speed controller (A7)
6. Fuse (F33, 1.5A)
7. Check cable to the cab fan motor (M7) for short-circuit or break.

10th menu item

Automatic air conditioner module (A6) outputs

Press key (3) once.
All outputs of the automatic air conditioner module (A6) are activated.



Example: Test step 10 is displayed

The speed is displayed as a bar display.

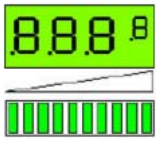
1. The heater solenoid coil (Y109) is switched on.
2. The compressor-type air conditioner electro-magnetic clutch solenoid coil (Y32) is activated.
3. The cab fan motor (M7) is switched on and works at max. speed.

Description of function: 7/7

11th menu item

Press key (3) once.
All segments of the bar and seven-segment displays are switched on.

Segment display



All segments of the seven-segment displays are switched on.

All segments of the bar displays are switched on.

The display function can be checked by visual control.

12th menu item

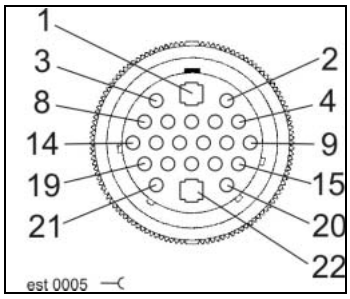
Press key (3) once. The automatic air conditioner module (A6) performs a RESET. Now the software version is displayed – the automatic air conditioner module (A6) now is in normal operation again.

Leaving the menu

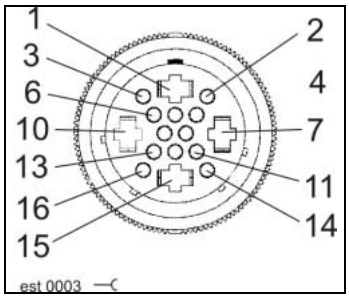
The software version is displayed.

Connector pin definition:

Socket D



Socket G



Interconnection list:

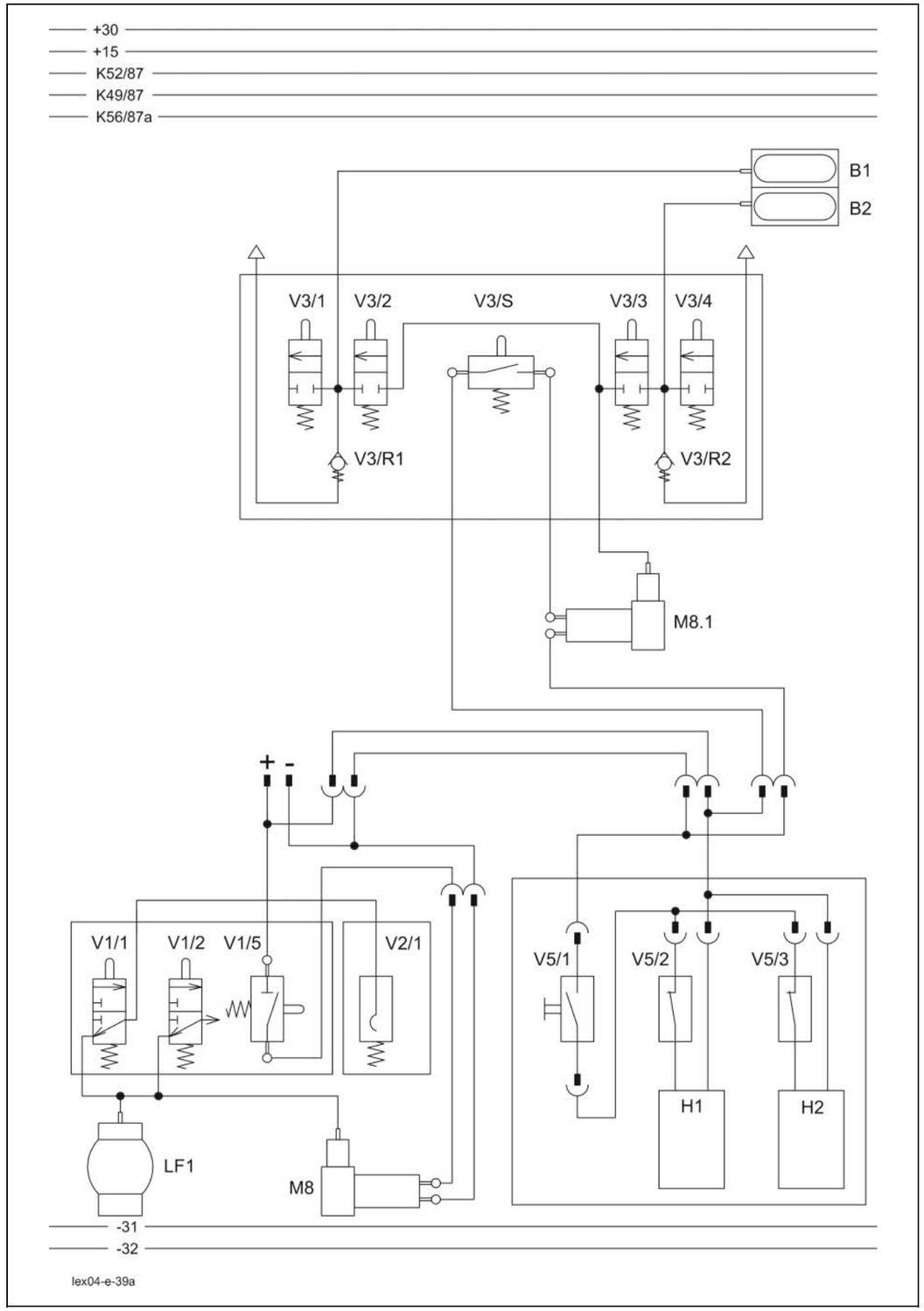
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
D 20	K24 86					1.5	rd-gn
D 22	F05 a					4.0	bk
G 14	A 6	K24 85				1.0	gn-vi
G 15	K24 87	DS 41				1.5	bk-gn

39a

Cab comfort equipment

- Operator's seat

39a Cab comfort equipment – operator's seat



Key to diagram: Coordinates

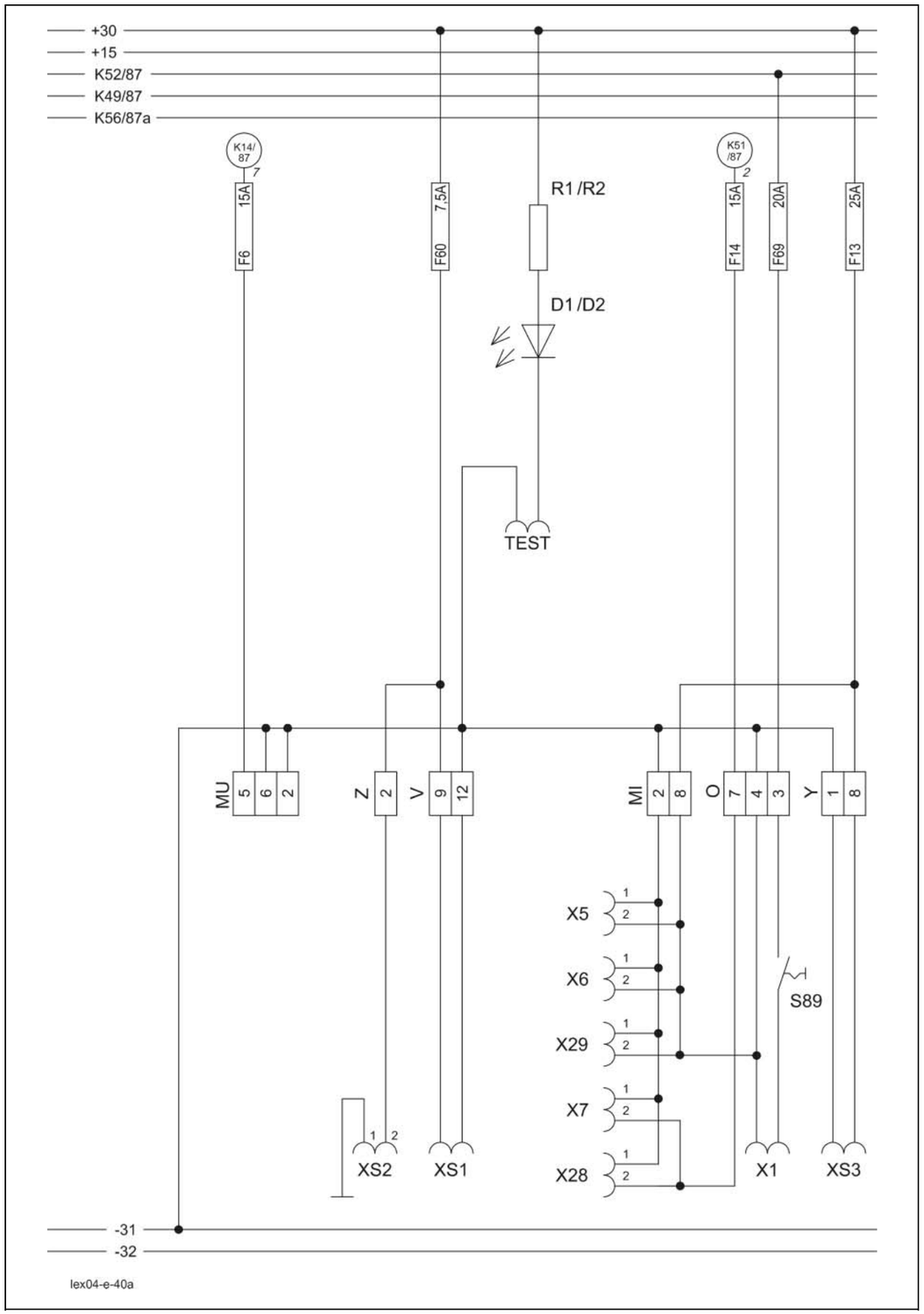
B1	Active lumbar support
B2	Active lumbar support
H1	Back heater
H2	Seat heater
LF1	Pneumatic spring
M8	Compressor
M8.1	Compressor
V5/1	Rocker switch
V5/2	Thermostat
V5/3	Thermostat
V1/1	3/2-way valve
V1/2	3/2-way valve
V1/5	NO contact
V2/1	Pneumatic clutch
V3/1	Active lumbar support, valve V3
V3/2	Active lumbar support, valve V3
V3/3	Active lumbar support, valve V3
V3/4	Active lumbar support, valve V3
V3/R1	Active lumbar support, valve V3
V3/R2	Active lumbar support, valve V3
V3/S	Active lumbar support, valve V3
X7	Seat connector 4-h-18

Description of function: None

40a

Additional sockets, fuse tester

40a Additional sockets, fuse tester



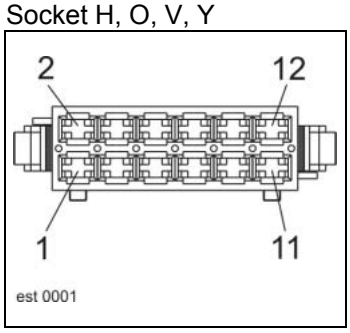
Key to diagram: Coordinates

D1/2	Fuse test LED	4-i-20
K14	Threshing mechanism relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
R32	Cigarette lighter resistor	3-h-17
R1/2	Fuse test series resistor	4-i-20
S89	Cooling box switch	4-i-19
TEST	Fuse test plug socket	4-i-20
X1	Cooling box connector	4-i-19
X5	Cigarette lighter connector	3-h-17
X6	Service 12 V panel connector	3-h-17
X7	Seat connector	4-h-18
X28	Service 12 V cab connector	3-h-17
X29	Cooling box connector	4-i-19
XS1	12 V service socket outlet, left	5-n-20
XS2	12 V service socket outlet, engine compartment	2-q-20
XS3	12 V service socket outlet, right	5-m-16

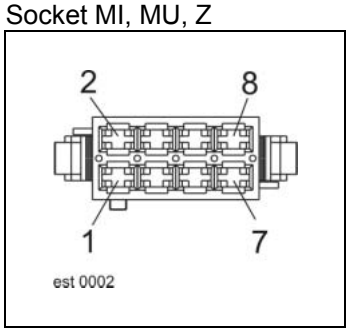
Description of function: None

Connector pin definition:

Socket H, O, V, Y



Socket MI, MU, Z



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
H 1							
H 2							
H 7							
MI 2	-31					2.5	br
MI 8	F13 a	Y 8				2.5	vi
MU 2							
MU 5							
MU 6							
MW 6							
O 3	F69 a					2.5	bk-rd
O 4	-31					2.5	b
O 7	F14 a					2.5	bk-vi
V 9	F60 a	Z 2				1.5	rd
V 12	-31					2.5	br
Y 1						2.5	br
Y 8						2.5	vi
Z 2						1.5	br

41s

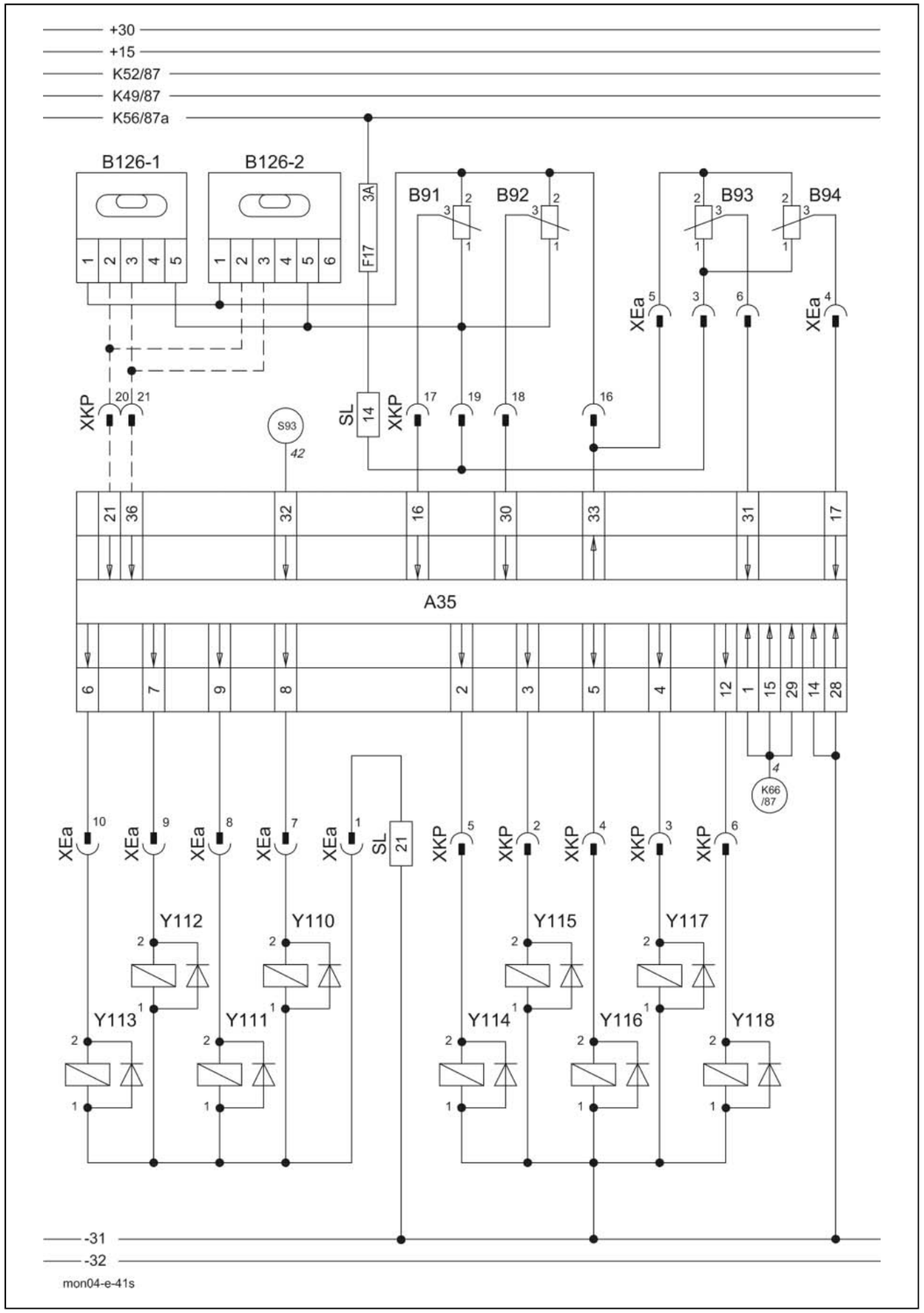
Axle control system,
front attachment control system

Montana 570-520

- with integrated MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

41s Axle control system, front attachment control system, Montana 570-520
- with integrated MONTANA control unit (up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram:

		Coordinates
A35	Montana control unit module	7-i-18
B91	Axle angle sensor, left	7-j-20
B92	Axle angle sensor, right	7-j-16
B93	Cutting angle sensor	7-e-17
B94	Montana cross levelling sensor	8-e-16
B126-1	Axle control system inclination sensor 1	
B126-2	Axle control system inclination sensor 2	
K66	Montana relay	3-h-20
S93	Parking brake switch	4-h-17
XEa	Montana feed rake conveyor connector	5-g-17
Y110	Raise cutting angle solenoid coil	7-f-16
Y111	Lower cutting angle solenoid coil	7-f-16
Y112	Rotate front attachment to the right solenoid coil	7-f-16
Y113	Rotate front attachment to the left solenoid coil	7-f-16
Y114	Lower axle on left-hand side solenoid coil	7-h-18
Y115	Raise axle on right-hand side solenoid coil	7-h-18
Y116	Lower axle on right-hand side solenoid coil	7-h-18
Y117	Raise axle on right-hand side solenoid coil	7-h-18
Y118	Oil quantity increase solenoid coil	7-h-18

Measured value table:

Item	Component	Measured value	Remark
B91 B92 B93 B94	Sensor	12 V 0.25 V – 4.75 V	(Pin 1-2) (Pin 1-3)
Y110 Y111 Y112 Y113 Y114 Y115 Y116 Y117 Y118	Solenoid coil	3.8 A 3.2 Ω	See lettering

Description of function: 1/5

Axle control system and front attachment control system

The system identifies the machine position using the inclination sensors B126-1 / B126-2 which transmit their values to the Montana module (A35) via an internal CAN bus. The solenoid coils (Y114, Y115, Y116, Y117) are actuated by the Montana module (A35) so that the machine is always in a vertical position by means of front axle movements. If the control system speed is not sufficient, the Montana module (A35) additionally actuates an oil quantity increase solenoid coil (Y118) in connection with the working hydraulics master valve (Y77) via the gear pre-selection module (A36) - circuit diagram 4s.

The position of the front attachment is adapted by rotating the front attachment frame (Y112, Y113) and by changing the cutting angle (Y110, Y111). This front attachment control system works independently of the AUTOCONTOUR system.
The Montana module (A35) receives the necessary feedback about the current position of the corresponding function from the respective angle sensors (B91, B92, B93, B94, B95).

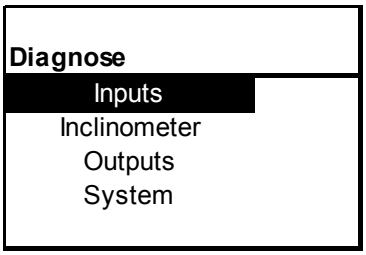
Important! All system calibrations using the Montana terminal (A41) require that the Montana control unit module A35 receives the signal from the unactuated parking brake (S93) - Circuit diagram 42s.

Axle control system diagnosis via Montana terminal A41

Call up the diagnosis menu with the menu key, the yellow cutting angle increase / decrease keys and the Enter key.

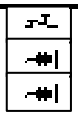
- Diagnosis inputs

Select the inputs section using the yellow keys and the Enter key.



Description of function: 2/5

Go to page 1/6 inputs using the yellow keys and the Enter key.
The parking brake symbol allows checking the function of parking brake switch S93 (symbol) – closed / open.

Diag. Inputs	1/6
Handbrake	
Reserve 1	
Reserve 2	

Go to page 2/6 inputs using the yellow keys and the Enter key.
The sensor value B91 is displayed.

Diag. Inputs	2/6
Cylinder left	
Sensor:	3.30 V
Cal.min.:	0.12 V
Cal.max.:	4.99 V
Position:	65.3%

Go to page 3/6 inputs using the yellow keys and the Enter key.
The sensor value B92 is displayed.

Diag. Inputs	3/6
Cylinder right	
Sensor:	2.01 V
Cal.min.:	0.00 V
Cal.max.:	4.86 V
Position:	41.3%

Go to page 4/6 inputs using the yellow keys and the Enter key.
The sensor value B93 is displayed.

Diag. Inputs	4/6
Cutting angle	
Sensor:	3.47 V
Cal.min.:	2.64 V
Cal.max.:	3.80 V
Position:	71.8%

Description of function: 3/5

Go to page 5/6 inputs using the yellow keys and the Enter key.
The sensor value B94 is displayed.

Diag. Inputs	5/6
Cross inclinat.	
Sensor:	1.57 V
Cal.min.:	1.18 V
Cal.max.:	2.53 V
Position:	28.7%

Go to page 6/6 inputs using the yellow keys and the Enter key.
The sensor value B95 is displayed.

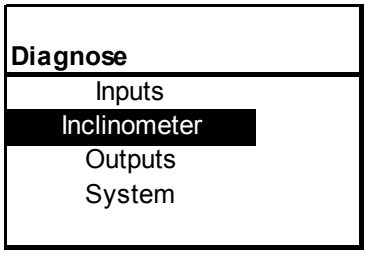
Note: Sensor B95 is not used by the system.

Diag. Inputs	6/6
Feeder housing	
Sensor:	2.78 V
Cal.min.:	0.00 V
Cal.max.:	4.86 V
Position:	57.2%

Description of function: 4/5

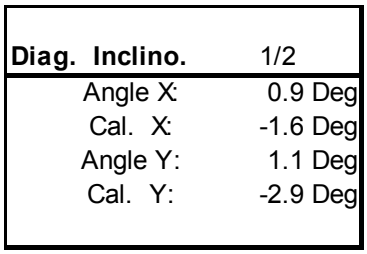
- Inclinometer diagnosis

Press menu key.
Select the inclinometer section using the yellow keys and the Enter key.



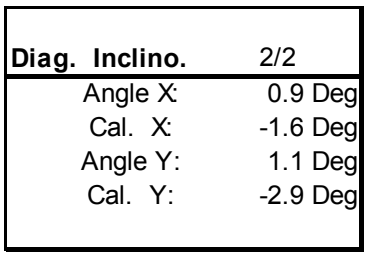
Go to page 1/2 Inclinometer using the yellow keys and the Enter key. The values of sensor B126-1 are displayed.

The most recently calibrated values cal. X / cal. Y can be compared with the current actual values of angle X and angle Y.
The sensor value B126-1 can be compared with sensor B126-2 - page 2/2.



Go to page 2/2 Inclinometer using the yellow keys and the Enter key. The values of sensor B126-2 are displayed.

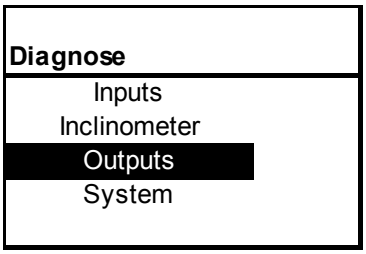
The most recently calibrated values cal. X / cal. Y can be compared with the current actual values of angle X and angle Y.
The sensor value B126-2 can be compared with sensor B126-1 - page 1/2.



Description of function: 5/5

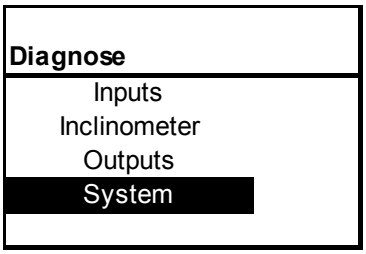
- Output diagnosis

Press menu key.
The outputs section cannot be used for axle control system diagnosis since the diagnosis mode does not allow axle control system operating functions.

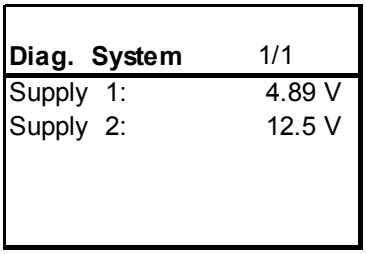


- Power supply diagnosis

Press menu back key. Select the system section using the yellow keys and the Enter key.

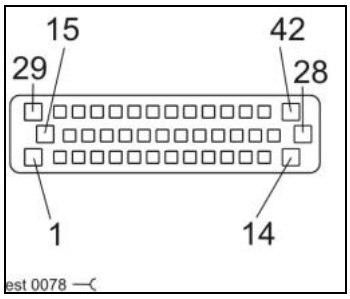


Go to page 1/1 system using the yellow keys and the Enter key. The power supply 2 value displays the current supply voltage of module A35. The power supply 1 value is not used by the system.

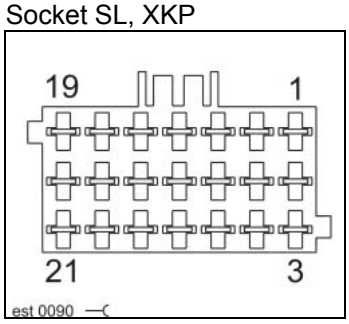


Connector pin definition:

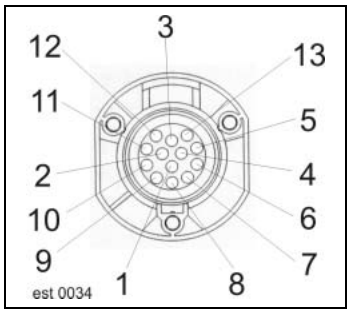
Socket A35



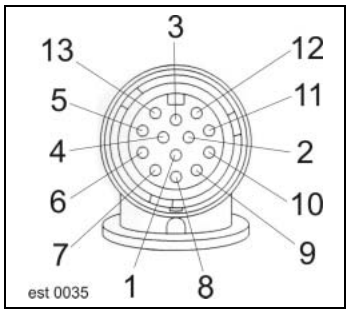
Socket SL, XKP



Socket XEa



Connector XEa



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
XEa-1						1.5	br
XEa-3						1.0	bk-bl
XEa-4						0.75	gn-vi
XEa-5						1.0	br-bl
XEa-6						1.0	bl-bk
XEa-7						1.0	gr-pi
XEa-8						1.0	gr-ye
XEa-9						1.0	bl-gn
XEa-10						1.0	gr-wh
XKP 2						1.0	gn-bl
XKP 3						1.0	or-bl
XKP 4						1.0	or-wh
XKP 5						1.0	bl-vi
XKP 6						1.0	br-gn
XKP 16						1.5	br-bl
XKP 17						1.0	bk-gr
XKP 18						1.0	br-gr
XKP 19						1.5	bk-bl
XKP 20						1.0	or-pi
XKP 21						1.0	ye-wh

41t

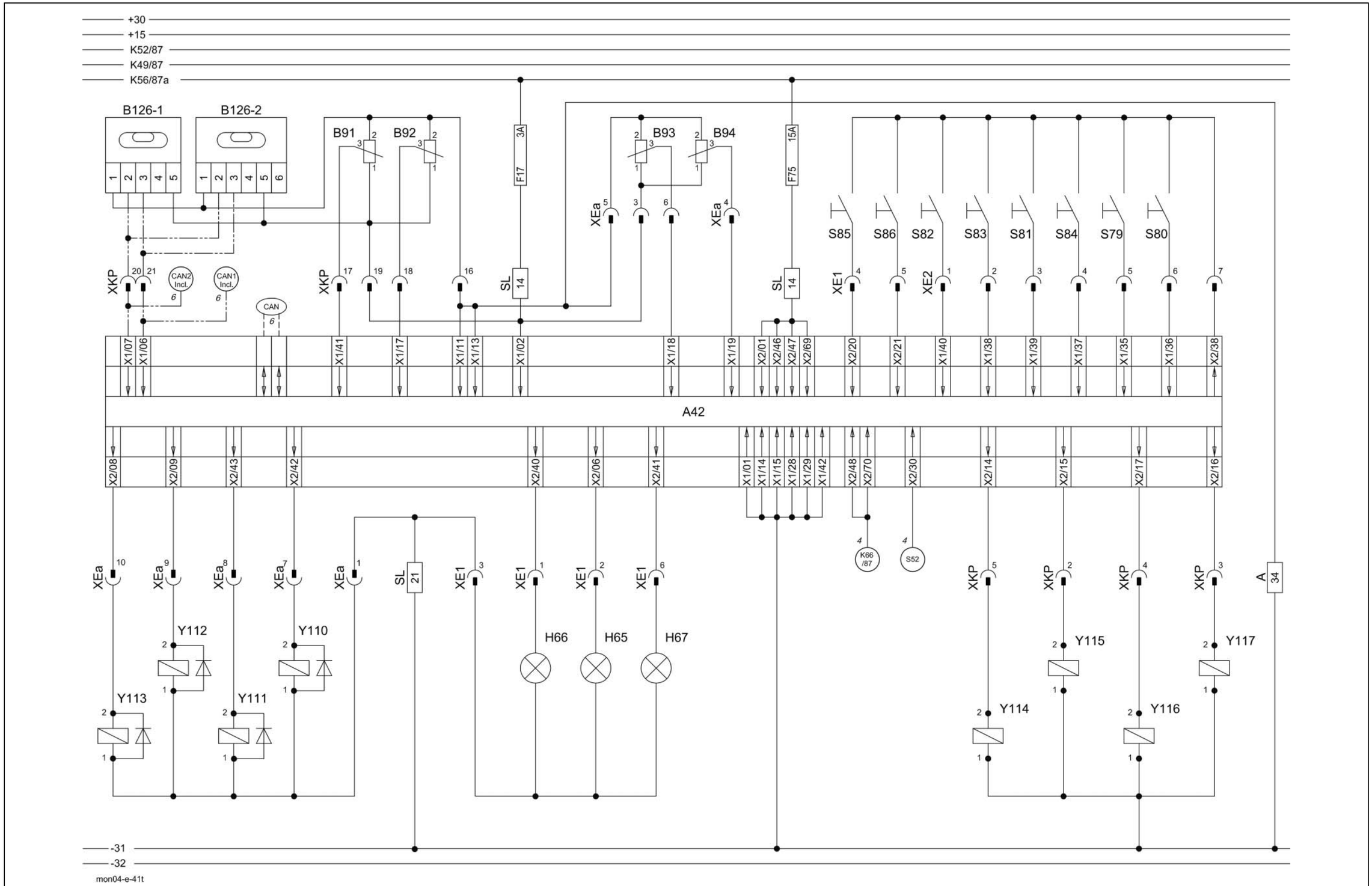
Axle control system, front attachment control system

Montana 570-520

- with integrated Montana control unit

- from serial no. 581 00027 to 581 00037

41t Axle control system and front attachment control system, Montana 570-520
– with integrated Montana control unit (from serial no. 581 00027 to 581 00037)



Key to diagram: Coordinates

A42	MONTANA GEN II module	3-h-17
B91	Axle angle sensor, left	7-j-20
B92	Axle angle sensor, right	7-j-16
B93	Cutting angle sensor	7-e-17
B94	Montana cross levelling sensor	8-e-16
B126-1	Axle control system inclination sensor 1	
B126-2	Axle control system inclination sensor 2	
CAN Incl.	Inclinometer CAN line	
H65	Manual axle control MONTANA function preselection indicator light	3-h-17
H66	Manual front attachment control MONTANA function preselection indicator light	3-h-17
H67	Automatic MONTANA operation indicator light	3-h-17
K66	MONTANA relay	3-h-20
S79	Manual axle control MONTANA function preselection switch	3-h-17
S80	Manual front attachment control MONTANA function preselection switch	3-h-17
S81	Switch Rotate machine **or** front attachment to the left MONTANA	3-h-17
S82	Switch Rotate machine **or** front attachment to the right MONTANA	3-h-17
S83	Switch Raise machine **or** cutting angle MONTANA	3-h-17
S84	Switch Lower machine **or** cutting angle MONTANA	3-h-17
S85	Automatic MONTANA operation switch	3-h-17
S86	MONTANA neutral axle position switch	3-h-17
S93	Parking brake switch	3-h-17
XEa	Montana feed rake conveyor connector	5-g-17
Y110	Raise cutting angle solenoid coil	7-f-16
Y111	Lower cutting angle solenoid coil	7-f-16
Y112	Rotate front attachment to the right solenoid coil	7-f-16
Y113	Rotate front attachment to the left solenoid coil	7-f-16
Y114	Lower axle on left-hand side solenoid coil	7-h-18
Y115	Raise axle on left-hand side solenoid coil	7-h-18
Y116	Lower axle on right-hand side solenoid coil	7-h-18
Y117	Raise axle on right-hand side solenoid coil	7-h-18

Measured value table:

Item	Component	Measured value	Remark
B91 B92 B93 B94	Sensor	12 V 0.25 V - 4.75 V	(Pin 1-2) (Pin 1-3)
Y110 Y111 Y112 Y113	Solenoid coil	3.8 A 3.2 Ω	See lettering
Y114 Y115 Y116 Y117	Solenoid coil	3.8 A 3.2 Ω	PWM, see lettering

Description of function:

Axle control system

The system identifies the machine position using the inclination sensors B126-1 / B126-2 which transmit their values to the MONTANA GEN II module (A42) via an internal CAN bus. The solenoid coils (Y114, Y115, Y116, Y117) are actuated by the MONTANA GEN II module (A42) so that the machine is always in a vertical position by means of front axle movements.

Front attachment control system

The position of the front attachment is adapted by rotating the front attachment frame (Y112, Y113) and by changing the cutting angle (Y110, Y111). This front attachment control system works in addition to and independently of the CLAAS AUTO-CONTOUR system (CAC).
The MONTANA GEN II module (A42) receives the necessary feedback about the current position of the corresponding function from the respective angle sensors (B91, B92, B93, B94, B95).

Montana axle hydraulics master valve

The MONTANA GEN II module energizes the **working hydraulics master valve (Y77)** with priority, according to the actuated MONTANA functions. Actuation here is via the CAN bus. Only when the control deviation becomes too small within a defined period of time (e.g. machine raises too slowly), the MONTANA master valve (Y128) is additionally energized – see circuit diagram 4t.

Calibration of MONTANA system

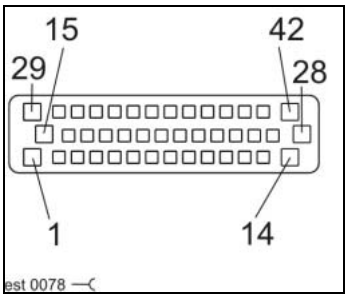
All calibrations are carried out via the CEBIS terminal in connection with the CLAAS Diagnosis System CDS.

Diagnosis of MONTANA system

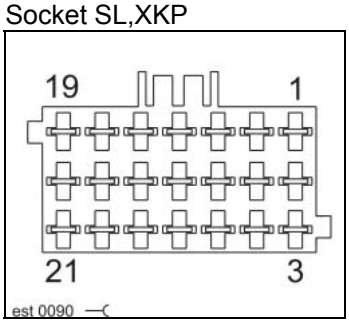
Reading out of data and display of sensor values is by means of the CLAAS Diagnosis System CDS.

Connector pin definition:

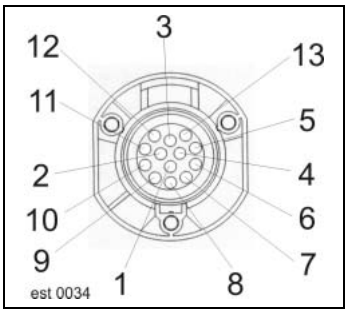
Socket A35



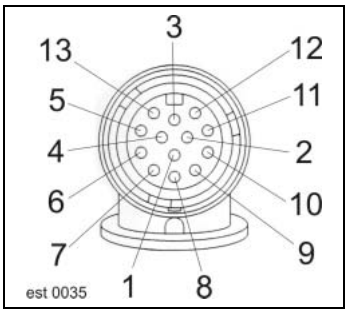
Socket SL,XKP



Socket XEa



Connector XEa



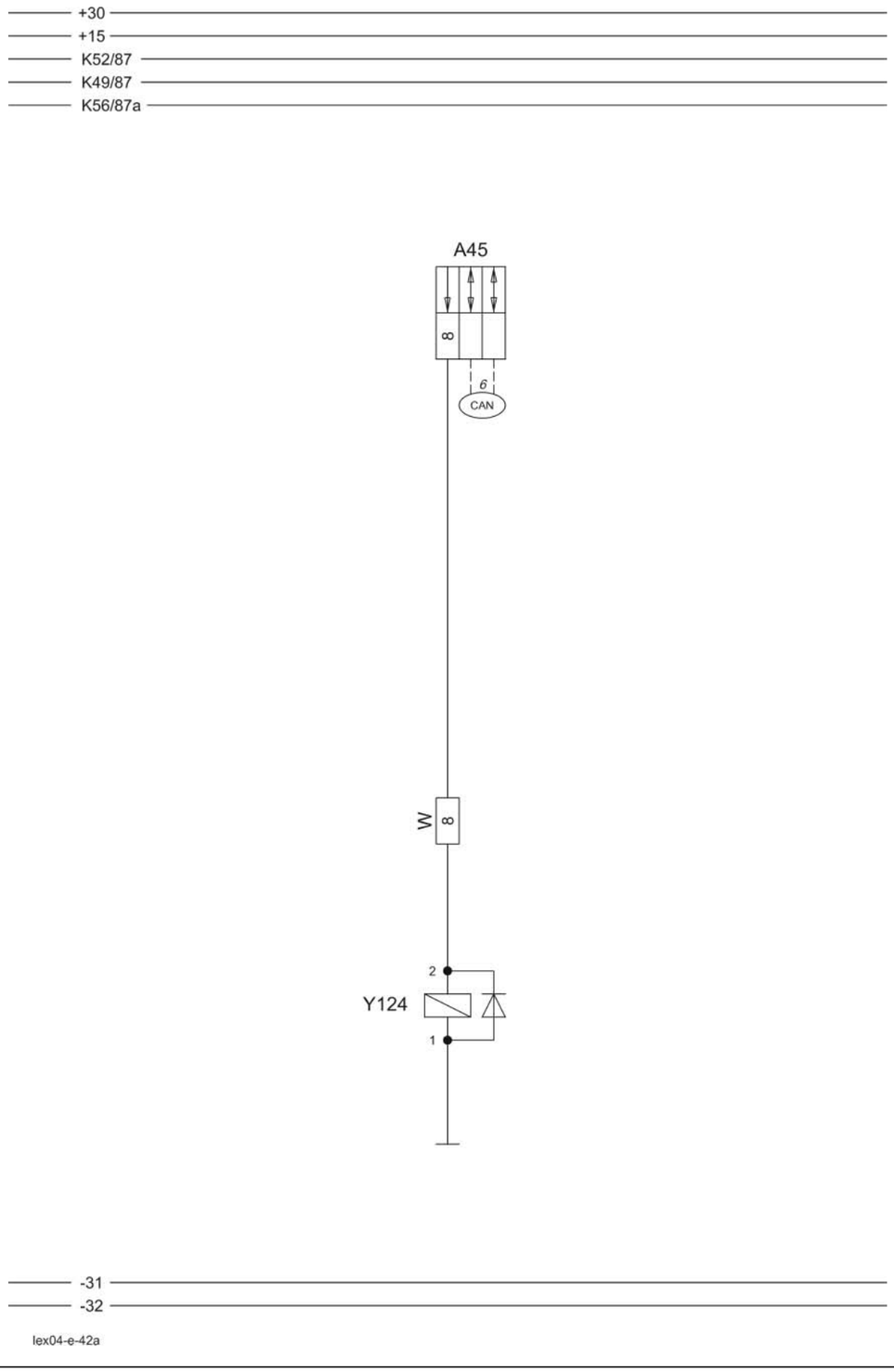
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
A 34						1.5	br-bl
SL14						1.0	bk-bl
SL 21						2.5	br
XEa-1						1.5	br
XEa-3						1.0	bk-bl
XEa-4						0.75	gn-vi
XEa-5						1.0	br-bl
XEa-6						1.0	bl-bk
XEa-7						1.0	gr-pi
XEa-8						1.0	gr-ye
XEa-9						1.0	bl-gn
XEa-10						1.0	gr-wh
XE1-1						0.5	vi-bk
XE1-2						0.5	wh
XE1-3						0.5	br
XE1-4						0.5	wh
XE1-5						0.5	wh
XE1-6						0.5	wh
XE2-1							
XE2-2						0.5	wh
XE2-3						0.5	wh
XE2-4						0.5	wh
XE2-5						0.5	wh
XE2-6						0.5	wh
XE2-7						0.5	wh-bl
XKP 2						1.0	gn-bl
XKP 3						1.0	or-bl
XKP 4						1.0	or-wh
XKP 5						1.0	bl-vi
XKP 6						1.0	br-gn
XKP 16						1.5	br-bl
XKP 17						1.0	bk-gr
XKP 18						1.0	br-gr
XKP 19						1.5	bk-bl
XKP 20						1.0	or-pi
XKP 21						1.0	ye-wh

42a

Ground drive and brake control

42a Ground drive and brake control



Key to diagram:

Coordinates

A45 Ground drive hydraulic motor brake restrictor module (HBM) 4-i-20

Y124 Ground drive brake restrictor solenoid coil..... 3-o-20

Measured value table:

Item	Component	Measured value	Remark
Y124	Solenoid coil	3.8 A 3.2 Ω	See inscription

Description of function:

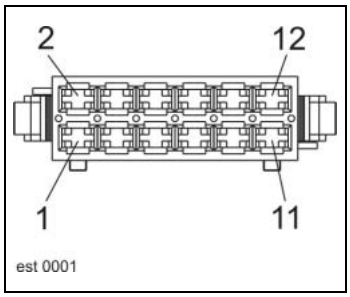
Hydrostatic brake valve system

When the diesel engine speed exceeds the allowed maximum of 2230 rpm (e.g. downhill travel), the ground drive hydraulic motor (HBM) brake restrictor module A45 also receives this information from the fieldwork computer module (BIF/CAB) A10 via the CAN bus. Now the ground drive hydraulic motor (HBM) brake restrictor module A45 actuates the master valve (Y77) in order to put a greater load on the drive (see also diagram 4).
When the diesel engine speed exceeds 2300 rpm, the brake restrictor (Y124) is additionally actuated in order to restrict the high-pressure circuit in the ground drive. When the speed now drops below 2210 rpm, the brake restrictor (Y124) is deactivated.

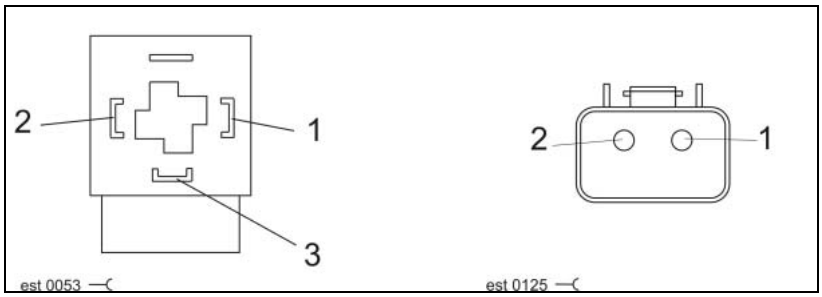
Note: The function of the ground drive hydraulic motor (HBM) brake restrictor module A45 may be checked using terminal A30. In the menu "Settings – Max. no-load speed – Speeds learn – OK", the outputs to the master valve (Y77) and to the module A45 are automatically switched for 5 seconds.

Connector pin definition:

Socket W



Socket Y124



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
W8	A45 8					1.0	ye-gn

42s

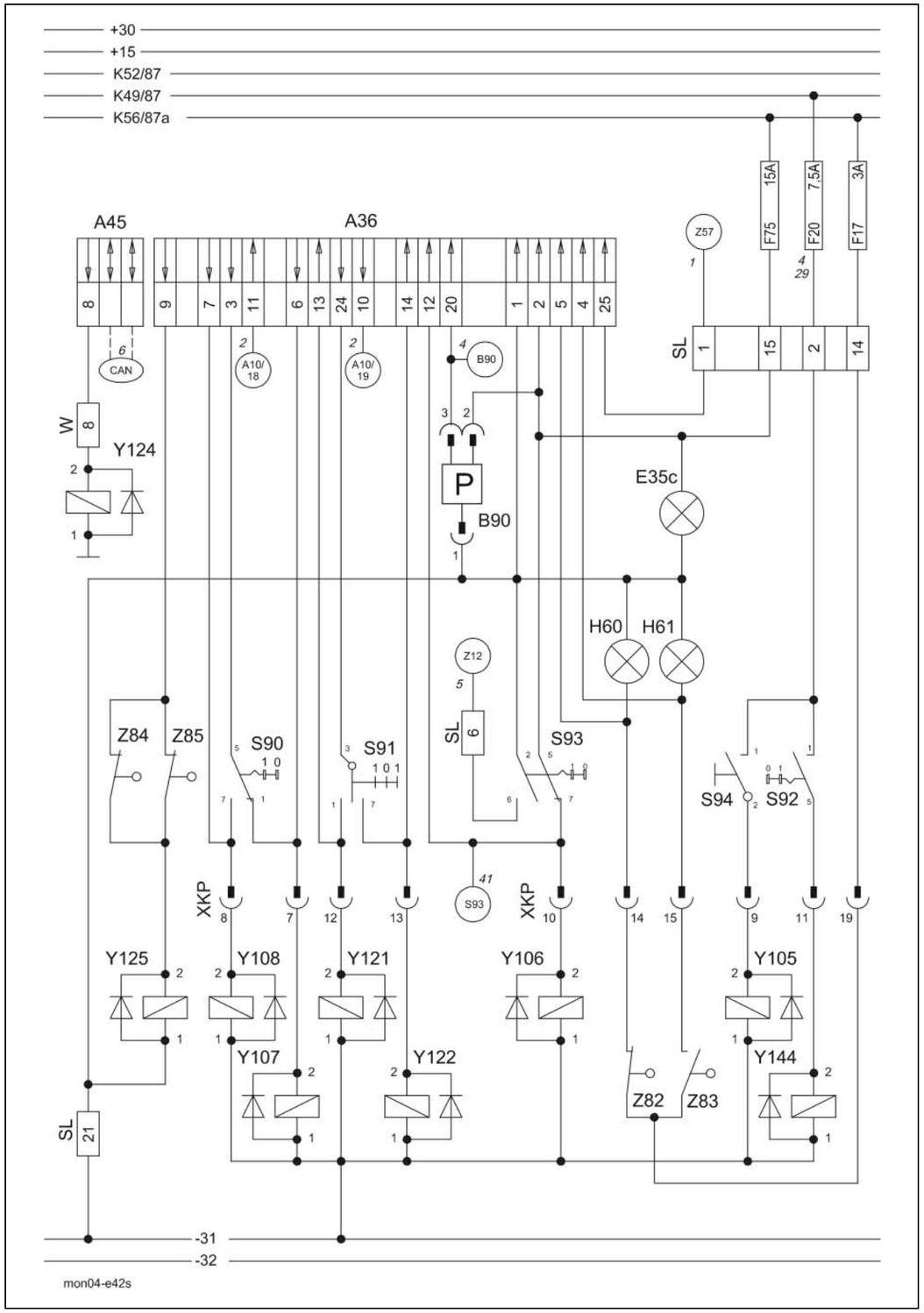
Ground drive and brake control

Montana 570-520

- with external MONTANA control unit

- up to serial no. 582 00051
  581 00026
  580 00028

42s Ground drive and brake control, Montana 570-520 - with external MONTANA control unit (up to serial no. 582 00051, 581 00026; 580 00028)



Key to diagram:

Coordinates

A36	Montana gearshift control module	2-h-20
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
B90	Brake accumulator pressure sensor/switch	5-g-20
E35c	Instrument lighting	3-g-17
H60	1st gear signal light	3-g-17
H61	2nd gear signal light	3-g-17
S90	Gearshift control switch	3-g-17
S91	Shifting aid switch	3-g-17
S92	Hydraulic motor fast/slow switch	3-g-17
S93	Parking brake switch	3-g-17
S94	Differential lock switch	5-f-19
Y105	Differential lock solenoid coil	7-h-18
Y106	Parking brake solenoid coil	7-h-18
Y107	Gearbox shift 1st gear solenoid coil	7-h-18
Y108	Gearbox shift 2nd gear solenoid coil	7-h-18
Y121	Uphill shifting aid solenoid coil	7-h-18
Y122	Downhill shifting aid solenoid coil	7-h-18
Y124	Ground drive brake restrictor solenoid coil	7-h-18
Y125	Ground drive control pressure solenoid coil	3-q-19
Y144	Hydraulic motor solenoid coil	7-h-18
Z57	Ground speed control lever neutral position switch - safety start switch	3-g-18
Z82	1st gear switch (actual value)	8-g-19
Z83	2nd gear switch (actual value)	8-g-19
Z84	Service brake left pedal switch	5-f-20
Z85	Service brake right pedal switch	5-f-20

Measured value table:

Item	Component	Measured value	Remark
B90	Brake circuit oil pressure / charge pressure	ON OFF	< 135 bar > 165 bar
Y121 Y122 Y124 Y144	Solenoid coil	3.8 A 3.2 Ω	
Y105 Y106 Y107 Y108 Y125	Solenoid coil	0.75 A 16 Ω	

Description of function: 1/2

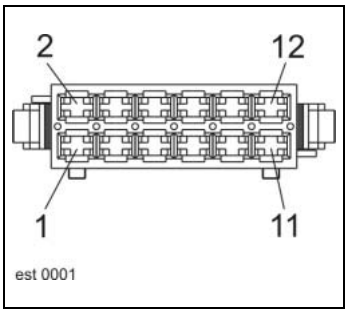
Gearshift control	Both the gearshift control switch (S90) and the shifting aid switch (S91) are supplied with power only if the signal of the ground speed control lever in neutral position (Z57) and of the applied parking brake (Z84/Z85) is applied to the gearshift control module (A36). When the shifting aid (S91) is actuated, the Montana master valve (Y128) is actuated via the gearshift control module (A36) – Circuit diagram 04s). In addition, the corresponding solenoid coil (Y121, Y122) loads the respective high-pressure circuit in the ground drive, making the hydraulic motor rotate slightly. This allows shifting the 1st gear (Y107) or the 2nd gear (Y108) easily by hydraulic means. The gearbox switches (Z82, Z83) allow indicating the engaged gear in the operating panel (H60, H61) and this gear is kept in position (Y107, Y108) by the feedback to the gearshift control module (A36) even when the parking brake is released. Via the gearshift control module (A36), the gearbox switch 2nd gear (Z83) also cuts the connection with the diesel engine speed adjustment (connection with A10) so that the road travel speed is automatically set. If none of the mechanical gears (Z82, Z 83) is engaged, no control oil pressure for the ground drive is built up since the gearshift control module (A36) does not actuate the solenoid coil (Y125).
Diesel engine speed adjustment - circuit diagram 2s	The diesel engine speed depends on the position of switch S35 and of the 2nd gear actual value switch (Z83). If full throttle speed is selected and the 2nd gear engaged (signal input A36 / pin 4), the connection between (A10/Pin18) and (A10/Pin19) inside the Montana gearshift control module (A36) is cut (pins 10 and 11). The full throttle speed is reduced to road travel speed, depending on the country version.
Parking brake	The parking brake (S93) is being actuated when solenoid coil (Y106) is not actuated. Besides the warning signals for insufficient brake oil pressure, the applied parking brake (S93/Z12) is also displayed in the terminal. If the parking brake (S93/Z12) is applied, no control oil pressure for the ground drive is built up since the gearshift control module (A36) does not actuate the solenoid coil (Y125).

Description of function: 2/2

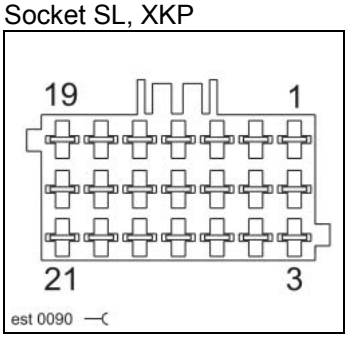
Service brake	When activating the left (Z84) and the right (Z85) service brake, the control oil pressure in the ground drive will also collapse at the solenoid coil (Y125) and the variable-displacement pump will swing back to zero delivery, independent of the ground drive control lever position.
Hydrostatic brake valve system	When the diesel engine speed exceeds the allowed maximum of 2230 rpm (e.g. downhill travel), the ground drive hydraulic motor (HBM) brake restrictor module A45 also receives this information from the fieldwork computer module via the CAN bus. Now the ground drive hydraulic motor (HBM) brake restrictor module A45 actuates the working hydraulics master valve (Y77) in order to put a greater load on the drive – Circuit diagram 4s. When the diesel engine speed exceeds 2300 rpm, the brake restrictor (Y124) is additionally actuated in order to restrict the high-pressure circuit in the ground drive. When the speed now drops below 2210 rpm, the brake restrictor (Y124) is deactivated.
Swing angle of hydraulic motor and differential lock.	The hydraulic drive ranges resulting from the changed swivel angle in the hydraulic motor (S92, Y144) and the differential lock inside the axle (S94, Y105) are set manually without any influence from the gearshift control menu (A36).
Montana brake pressure accumulator	The sensor/switch (B90) controls the brake system accumulator pressure and, if necessary, actuates the working hydraulics master valve (Y77) via the gearshift control module (A36/pin16), the diode PCB D0 and the Ground drive hydraulic motor brake restrictor module (A45/pin5→pin2) in order to recharge the brake circuit accumulator – circuit diagram 04s.

Connector pin definition:

Connector W



Socket SL, XKP



Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
XKP-7						1.0	gr-vi
XKP-8						1.0	br-wh
XKP-9						1.0	br-bk
XKP-10						1.0	pi-gn
XKP-11						1.0	or-gn
XKP-12						1.0	or-gr
XKP-13						1.0	or-ye
XKP-14						0.75	pi-bl
XKP-15						0.75	br-vi
XKP-19						1.5	bk-bl
SL 1						1.0	gr-bl
SL 2						1.0	bk-gn
SL 14						0.75	bk-bl
SL 15						0.75	bk-ye
SL 21						1.0	ye-wh
A36-1						1.5	br
A36-2						1.5	bk-bl
A36-3						1.0	wh-bl
A36-4						0.75	br-vi
A36-5						0.75	pi-bl
A36-6						1.0	gr-vi
A36-7						1.0	br-wh
A36-9						1.0	bl-wh
A36-10						1.0	wh-gr
A36-11						1.0	vi-bk
A36-12						1.0	pi-gn
A36-13						1.0	or-gr
A36-14						1.0	or-ye
A36-20						1.0	rd-bl
A36-24						1.0	bl-rd
A36-25						1.5	bl-gr
B90-1						1.5	bk-bl
B90-2						1.0	rd-bl
B90-3						1.5	br
W 8						1.0	ye-gn

42t

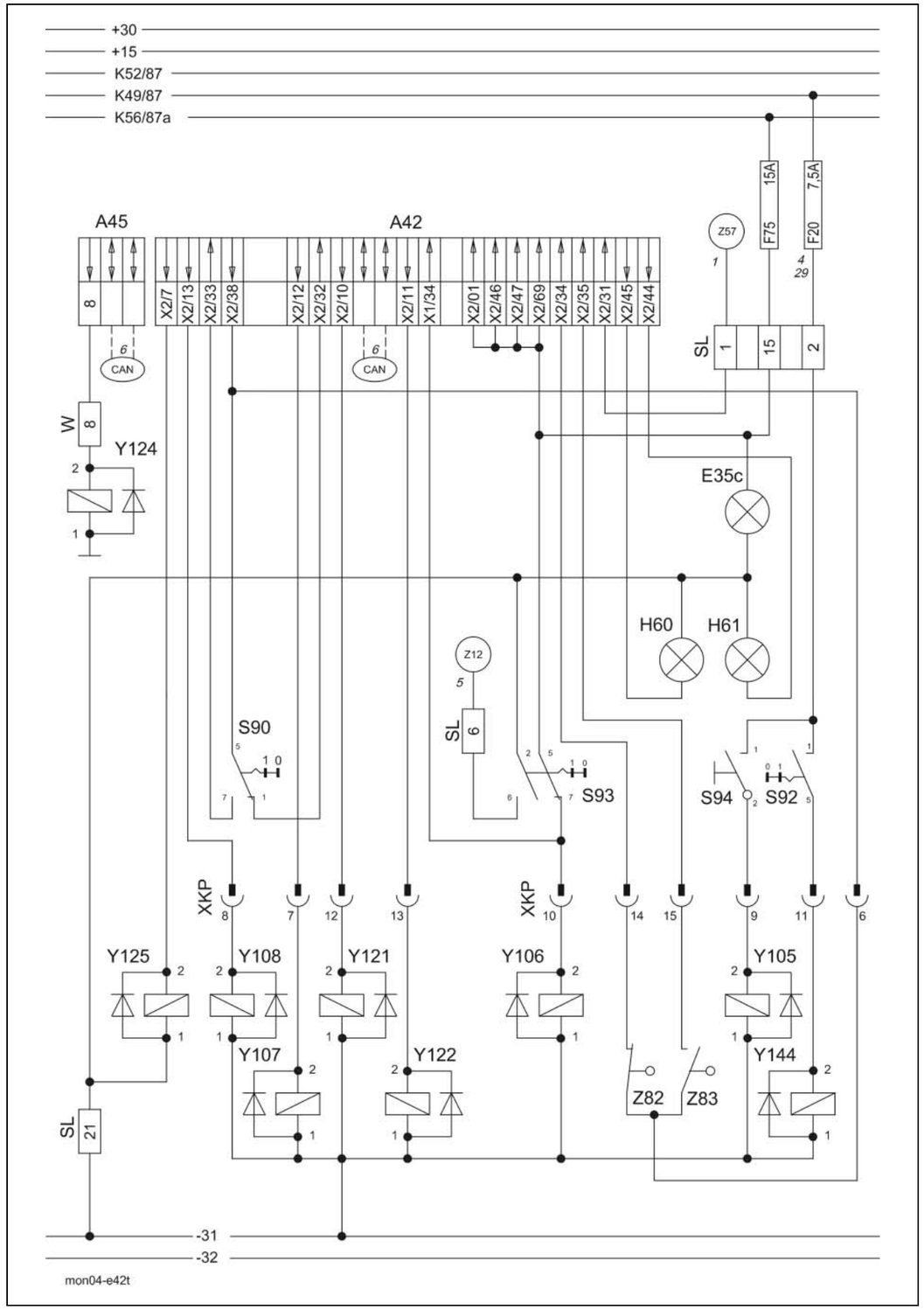
Ground drive and brake control

Montana 570-520

- with integrated Montana control unit

- from serial no. 581 00027 to 581 00037

42t Ground drive and brake control, Montana 570-520 - with integrated MONTANA control unit (from serial no. 581 00027 to 581 00037)



Key to diagram:

Coordinates

A42	MONTANA GEN II module	3-h-17
A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
E35c	Instrument lighting	3-g-17
H60	1st gear signal light	3-g-17
H61	2nd gear signal light	3-g-17
S90	Gearshift control switch	3-g-17
S92	Hydraulic motor fast/slow switch	3-g-17
S93	Parking brake switch	3-g-17
S94	Differential lock switch	5-f-19
Y105	Differential lock solenoid coil	7-h-18
Y106	Parking brake solenoid coil	7-h-18
Y107	Gearbox shift 1st gear solenoid coil	7-h-18
Y108	Gearbox shift 2nd gear solenoid coil	7-h-18
Y121	Uphill shifting aid solenoid coil	7-h-18
Y122	Downhill shifting aid solenoid coil	7-h-18
Y124	Ground drive brake restrictor solenoid coil	7-h-18
Y125	Ground drive control pressure solenoid coil	3-q-19
Y144	Hydraulic motor solenoid coil	7-h-18
Z57	Ground speed control lever neutral position actual value switch - safety start switch	3-g-18
Z82	1st gear actual value switch (actual value)	8-g-19
Z83	2nd gear actual value switch (actual value)	8-g-19

Z12 **Note:** The link (Z12) does not describe any real parking brake actual value switch such as that provided on a standard machine. On MONTANA machines, the required signal from the parking brake is read in at the same time by switch (S93).

Measured value table:

Item	Component	Measured value	Remark
Y121 Y122 Y124 Y144	Solenoid coil	3.8 A 3.2 Ω	
Y105 Y106 Y107 Y108 Y125	Solenoid coil	0.75 A 16 Ω	

Description of function: 1/2

Gearshift control

The gearshift control switch (S90) is supplied with power only if the signal of the ground speed control lever in neutral position (Z57) and of the applied parking brake (Z84/Z85) is applied to the MONTANA GEN II module (A42).

While shifting gears, the solenoid coils (Y121, Y122) are energized alternatingly at short intervals and the working hydraulics master valve (Y77) in parallel with them.
The high-pressure circuits in the ground drive are subject to pressure alternatingly, which sets the hydraulic motor slightly in rotation in one or the other direction. This makes engaging the gears in the gearbox (Y107, Y108) much easier.

The engaged gear is displayed in the operating panel (H60, H61) via the gearbox switches (Z82, Z83).

If none of the mechanical gears (Z82, Z 83) is engaged, no control oil pressure for the ground drive is built up since the MONTANA GEN II module (A42) does not actuate the solenoid coil (Y125).

Diesel engine speed adjustment – circuit diagram 2t

The diesel engine speed depends on the position of switch S35 and of the 2nd gear actual value switch (Z83).
When full throttle speed is activated and 2nd gear is engaged, the full throttle speed is reduced to road travel speed specifically for each country.

Swing angle of hydraulic motor and differential lock.

The hydraulic drive ranges resulting from the changed swivel angle in the hydraulic motor (S92, Y144) and the differential lock inside the axle (S94, Y105) are set manually without any influence from the gearshift control menu (A36).

Description of function: 2/2

Hydrostatic brake valve system

When the diesel engine speed exceeds the allowed maximum of 2230 rpm (e.g. downhill travel), the ground drive hydraulic motor (HBM) brake restrictor module A45 also receives this information from the fieldwork computer module via the CAN bus. Now the ground drive hydraulic motor (HBM) brake restrictor module A45 actuates the working hydraulics master valve (Y77) in order to put a greater load on the drive – Circuit diagram 4t.
When the diesel engine speed exceeds 2300 rpm, the brake restrictor (Y124) is additionally actuated in order to restrict the high-pressure circuit in the ground drive. When the speed now drops below 2210 rpm, the brake restrictor (Y124) is deactivated.

Service brake

Pressing both brake pedals (Z84/Z85) is a pre-condition for shifting the gears in the manual gearbox.
To guarantee that the machine is standing still, a brake pressure of 25 bar min. must be built up by the force acting on the pedal.
At the same time, the control oil pressure necessary for the ground drive is relieved – see circuit diagram 41t.

Montana brake oil pressure / brake pressure accumulator warning

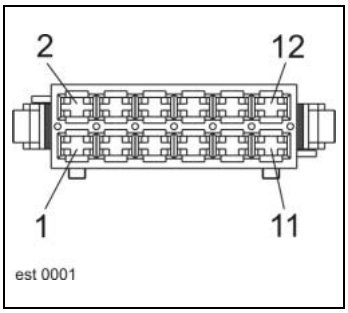
At a pressure below 115 bar, the voltage signal from the left / right brake circuit pressure switches (Z79/Z80) is connected to the terminal (A30) and displayed as an alarm message.
Reloading the brake circuit is controlled via the brake circuit charge pressure sensor (B90) – see circuit diagram 4t.

Parking brake

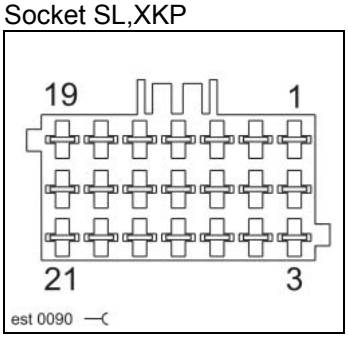
The parking brake (S93) is being actuated when solenoid coil (Y106) is not actuated.
Besides the warning signals for insufficient brake oil pressure, the applied parking brake (S93/Z12) is also displayed in the terminal.
If the parking brake (S93/Z12) is applied, no control oil pressure for the ground drive is built up since the MONTANA GEN II module (A42) does not actuate the solenoid coil (Y125).

Connector pin definition:

Connector W



Socket SL,XKP



Interconnection list:

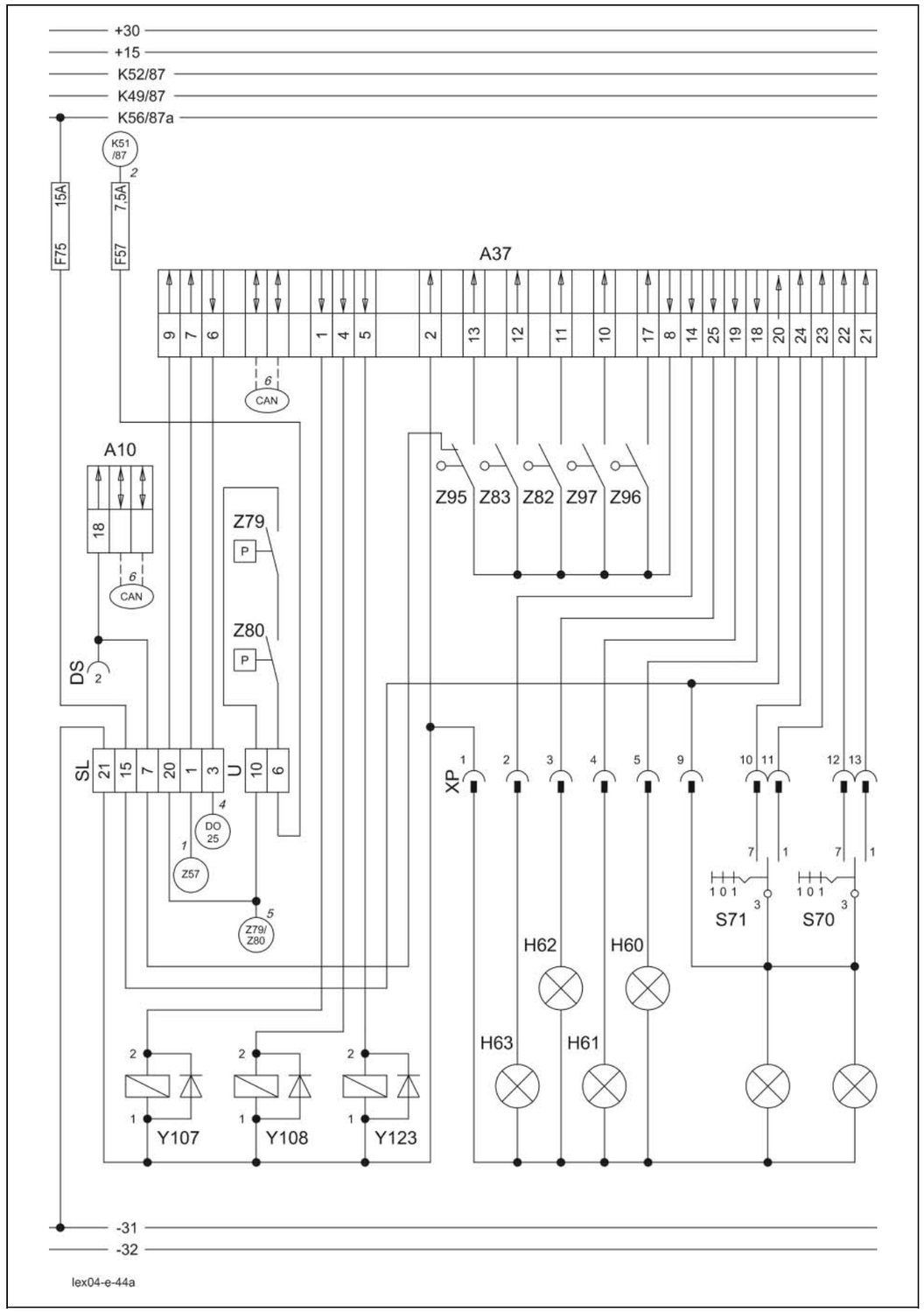
from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
XKP-6						1.0	wh-bl
XKP-7						1.0	gr-vi
XKP-8						1.0	br-wh
XKP-9						1.0	br-bk
XKP-10						1.0	pi-gn
XKP-11						1.0	or-gn
XKP-12						1.0	or-gr
XKP-13						1.0	or-ye
XKP-14						0.75	pi-bl
XKP-15						0.75	br-vi
SL 1						1.0	gr-bl
SL 2						1.0	bk-gn
SL 14						0.75	bk-bl
SL 15						0.75	bk-ye
SL 21						1.0	ye-wh
A36-1						1.5	br
A36-2						1.5	bk-bl
A36-3						1.0	wh-bl
A36-4						0.75	br-vi
A36-5						0.75	pi-bl
A36-6						1.0	gr-vi
A36-7						1.0	br-wh
A36-9						1.0	bl-wh
A36-10						1.0	wh-gr
A36-11						1.0	vi-bk
A36-12						1.0	pi-gn
A36-13						1.0	or-gr
A36-14						1.0	or-ye
A36-20						1.0	rd-bl
A36-24						1.0	bl-rd
A36-25						1.5	bl-gr
B90-1						1.5	bk-bl
B90-2						1.0	rd-bl
B90-3						1.5	br
W 8						1.0	ye-gn

44a

Electro-hydraulic gearshift

3-speed manual gearbox

44a Electro-hydraulic gearshift - 3-speed manual gearbox



Key to diagram:

Coordinates

A10	Fieldwork computer module (BIF/CAB)	2-i-20
A37	Electro-hydraulic gearshift (EHS) module	2-i-20
DO	Master valve diode PCB	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
H60	Gearbox 1st gear signal light	3-h-17
H61	Gearbox 2nd gear signal light	3-h-17
H62	Gearbox 3rd gear signal light	3-h-17
H63	Gearbox neutral signal light	3-h-17
K51	Ignition lock relay	4-i-20
K56	Electronic unit plus relay	4-i-20
S70	Gear selection – gearshift 1st/2nd gear	3-h-17
S71	Gear selection – gearshift 3rd gear / neutral	3-h-17
XP	EHS connector (central terminal compartment / operating panel)	3-i-20
Y107	Gearbox shift 1st gear solenoid coil	7-i-18
Y108	Gearbox shift 2nd gear solenoid coil	7-i-18
Y123	Gearbox shift 3rd gear solenoid coil	7-i-18
Z57	Ground speed control lever neutral position actual value switch - safety start switch	3-h-17
Z79	Left brake circuit pressure actual value switch	5-g-17
Z80	Right brake circuit pressure actual value switch	5-g-17
Z82	1st gear engaged gearshift switch actual value switch	7-i-18
Z83	2nd gear engaged gearshift switch actual value switch	7-i-18
Z95	3rd gear engaged gearshift switch actual value switch	7-i-18
Z96	1st gear neutral gearshift switch actual value switch	7-i-18
Z97	2nd / 3rd gear neutral gearshift switch actual value switch	7-i-18

Measured value table:

Item	Component	Measured value	Remark
Y107 Y108 Y123	Solenoid coil	3.8 A 3.2 Ω	See inscription
Z79 Z80	Pressure switch	20 bar	NO contact

Description of function:

Electro-hydraulic gearshift

As a pre-condition for carrying out an electro-hydraulic drive range changeover, the signals of the actual value switch Z57 (ground speed control lever in neutral position), Z79 and Z80 (actuation of both service brakes) must be identified by the electro-hydraulic gearshift (EHS) module A37.

Module A37 (EHS) controls the solenoid coils Y107, Y108 and Y123 of the gear preselection correspondingly via switches S70 and S71.

The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the solenoid coils by module A37 (EHS) because these functions require that pressure is built up in the system.

The realization of the drive range changeover is controlled by module A37 (EHS) via the actual value switches Z82, Z83, Z95, Z97 and Z96.

Module A37 (EHS) performs several gearshift processes under program control for changing over the drive range if necessary if the changeover process is hindered by external influences on the gearshift.
If the selected gear cannot be engaged within 1 second, another attempt is made for engaging other gears.
An error message in terminal (A30) appears when the gear cannot be engaged within 4 seconds.
At the same time, the gearbox neutral signal light H63 flashes.

The gear engaged is indicated by the signal lights H60, H61, H62 and H63.

Supply voltage of gearshift actual value switches

The supply voltage of the gearshift actual value switches from pin 8 of module A37 (EHS) is 12 volt and is limited to a current consumption of 200 mA max.

Important! Suitable measuring devices must be used for error diagnosis.

Diagnosis

Errors occurred during the gearshift process are displayed as messages on terminal A30.

Gearshift logic EHS 3-speed:

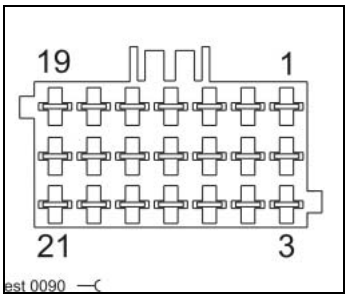
	1st gear engaged	2nd gear engaged	3rd gear engaged	2nd and 3rd gear neutral position	1st gear neutral position
Designation	**Z82**	**Z83**	**Z95**	**Z97**	**Z96**
Switch type	NO contact	NO contact	Changeover contact	NO contact	NO contact
Module A37	Pin 11	Pin 12	Pin 13	Pin 10	Pin 17
1st gear	12 V (200 mA)	0 V	0 V	12 V (200 mA)	0 V
2nd gear	0 V	12 V (200 mA)	0 V	0 V	12 V (200 mA)
3rd gear	0 V	0 V	12 V (200 mA)	0 V	12 V (200 mA)
Neutral	0 V	0 V	0 V	12 V (200 mA)	12 V (200 mA)

Possible errors:

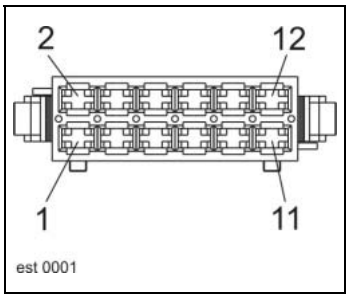
Brake pressure switch of gearshift defective	When the signal from switches Z79 and Z80 has been identified for more than 30 minutes, the message "Braking pressure switch for gear-shift mechanism defective" is displayed on terminal A30. Shifting gears is prevented until the signals from switches Z79 and Z80 are again identified as being a correct function. The error is stored in the error memory.
Ground speed control lever neutral position defective	If signals from the ground speed sensor (B16) are still present although the "Ground speed control lever neutral" signal has been detected, the message "Ground speed control lever neutral position switch defective" is displayed on terminal A30. Shifting gears is prevented until a correct function is again detected. The error is stored in the error memory (see also diagram 25).
Gearshift operating error	If the signals from the brake circuit pressure switches Z79 and Z80 or from the ground speed control lever neutral switch Z57 are interrupted during the shifting process, the changeover is not carried out any more. The message "**Ground speed lever in neutral position! / Apply foot brake – otherwise unable to change gear!**" is displayed on terminal A30.

Connector pin definition:

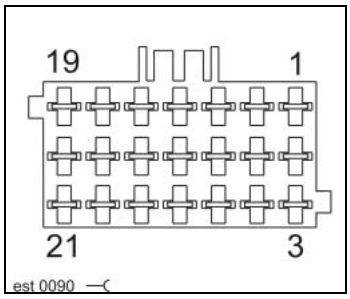
Socket SL



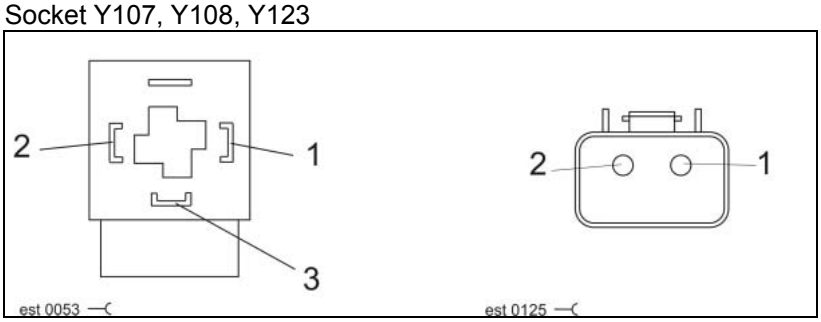
Socket U



Socket XP



Socket Y107, Y108, Y123



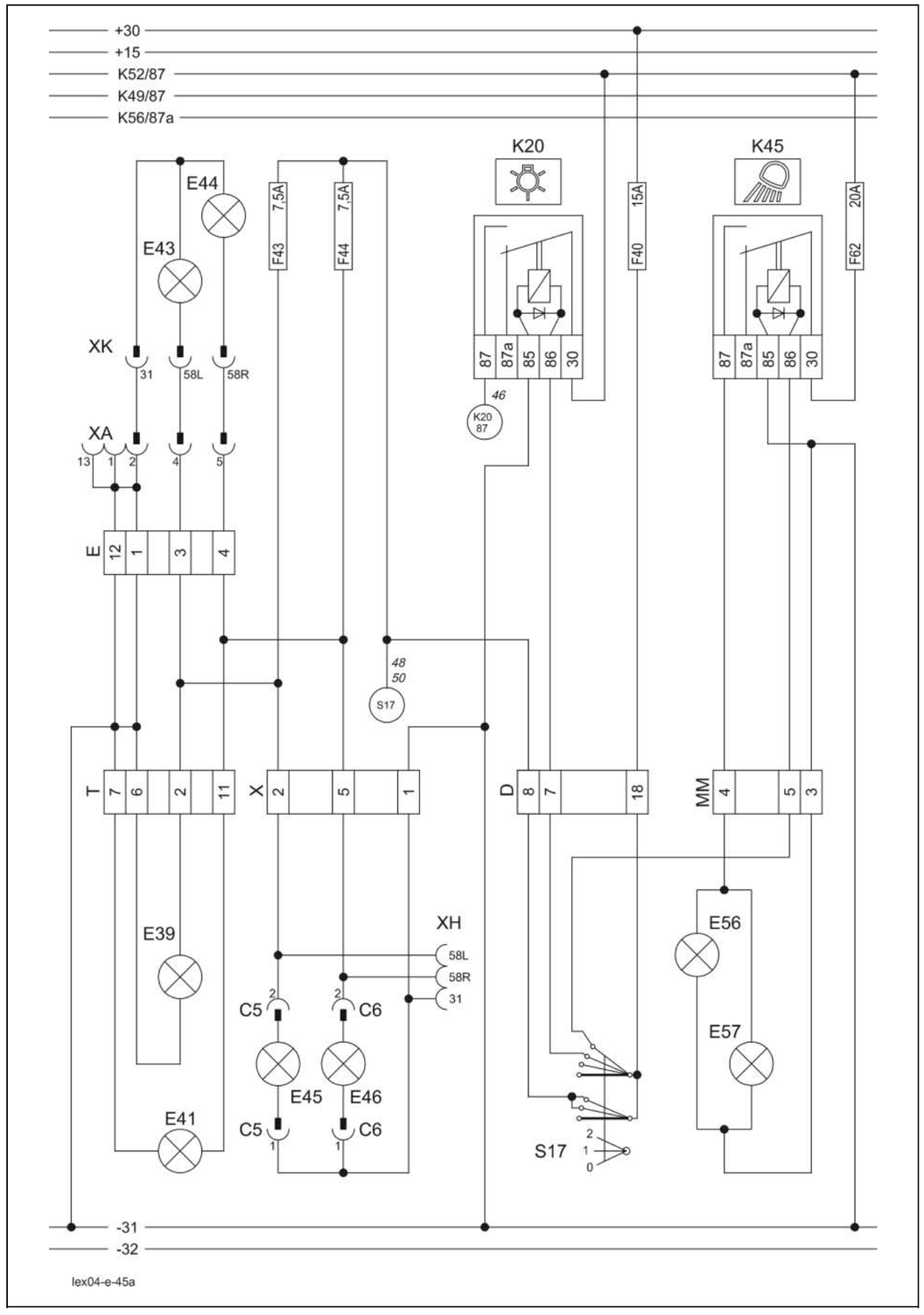
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
SL 1	P 5	K12 86				0.75	bl-gr
SL 3	DO25					0.75	vi-rd
SL 7	DS 2	A10 18				0.75	vi-bk
SL 15	F75 a					1.5	bk-bl
SL 20	U 10	A 1				1.5	vi-bk
SL 21	-31					2.5	br
U 4	-31					2.5	br
U 10	A 1	SL 20				1.5	vi-wh
XP-1						1.0	br
XP-2						1.0	gn-bl
XP-3						1.0	or-bl
XP-4						1.0	or-wh
XP-5						1.0	bl-vi
XP-9						1.0	bk-bl
XP-10						1.0	pi-gn
XP-11						1.0	or-gn
XP-12						1.0	or-gr
XP-13						1.0	or-ye
Z82 – 1						0.75	bl-br
Z82 – 2						0.75	gn-wh
Z83 – 1						0.75	bl-br
Z83 – 2						0.75	gn-gr
Z95 – 1						0.75	bl-br
Z95 – 2						0.75	gn-rd
Z95 - 3						0.75	vi-bk
Z96 – 1						0.75	bl-br
Z96 – 2						0.75	gn-bk
Z97 – 1						0.75	bl-br
Z97 – 2						0.75	vi-or

45a

Main lighting circuit,
taillight, position light

45a Main lighting circuit, taillight, position light



Key to diagram:

Coordinates

E39	Position light, left	5-g-20
E41	Position light, right	5-g-16
E43	Position light, front attachment left	8-a-20
E44	Position light, front attachment right	8-a-16
E45	Taillight, left	4-u-20
E46	Taillight, right	4-u-16
E56	Worklight, railing outside left	2-g-20
E57	Worklight, railing outside right	2-g-16
K20	Lighting main relay	4-i-20
K45	Worklights relay	4-i-20
K52	Power supply relay	4-i-20
S17	Vehicle lighting main switch	2-g-18
XA	Multifunction coupling A connector	8-f-20
XH	Trailer lighting connector	7-r-18
XK	Front attachment lighting connector	8-c-18

Measured value table:

Item	Component	Measured value	Remark
K20	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K45	Remote control relay 40 A changeover contact	90±10 Ω	(Pin 86/1 – 85/2

Description of function:

Sidefinder function:

For better lateral lighting during threshing, additional lights (sidefinders) are available as accessories.

When actuating the indicator switch (S16), a signal input is connected in parallel to the sidefinder module (A33).

When the threshing mechanism is **active** (K14 – circuit diagram 7a) and the lighting has been switched on by the vehicle lighting main switch (S17 -), the indicator switch (S16) allows switching the sidefinders (E71/E72).

As soon as the signal from the vehicle lighting main switch (S17) and/or threshing mechanism ON (K14) is missing, the sidefinders are switched off.

Pathfinder function:

Activating the pathfinder function using the indicator switch (S16):

- This function is available only when the machine is at standstill (lights off, threshing mechanism off, ignition off).
- Actuate the indicator switch (S16).
- The pathfinder function is started using the headlight flasher (wake up) and it does not matter if the indicator switch (S16) was actuated to the left or to the right.

Activating the pathfinder function using the vehicle lighting main switch (S17):

- Threshing mechanism off
- Ignition off
- Lights off
- Repeatedly switching the lights on/off re-starts the pathfinder function (up to 15 min. max. after ignition off).
- Both sidefinders plus the dipped headlights are switched on simultaneously.

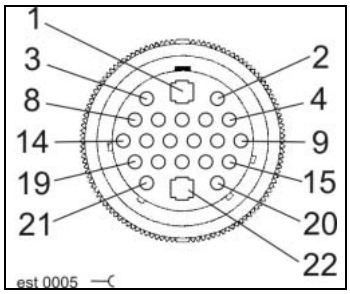
After 1 minute or after repeated actuation of the indicator or of the light switch, the module shuts down all outputs and then shuts down itself.

Note:

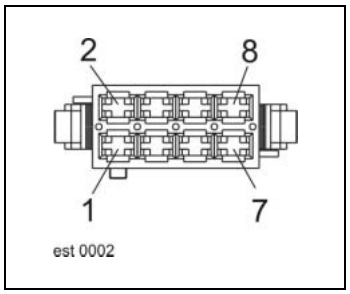
- Indicator switch (S16) → Circuit diagram 36
- Vehicle lighting main switch (S17) → Circuit diagram 45
- Pathfinder lighting → Circuit diagram 47, 48
- Sidefinder lighting → Circuit diagram 48

Connector pin definition:

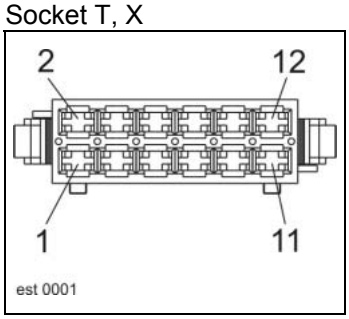
Socket D



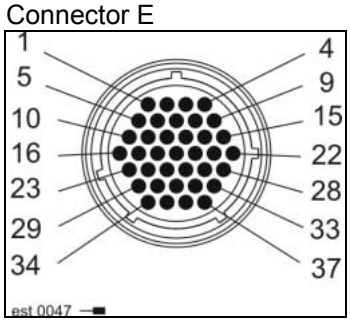
Socket MM



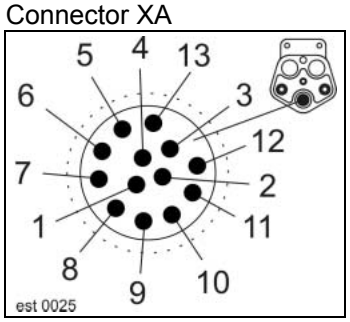
Socket T, X



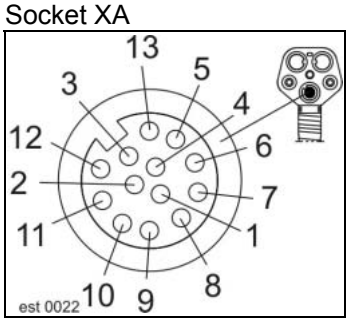
Connector E



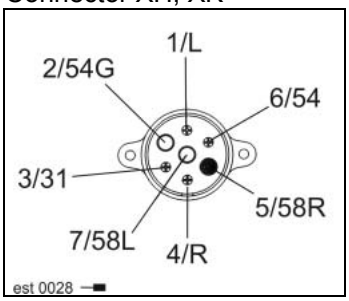
Connector XA



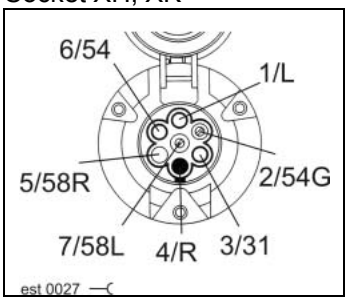
Socket XA



Connector XH, XK



Socket XH, XK



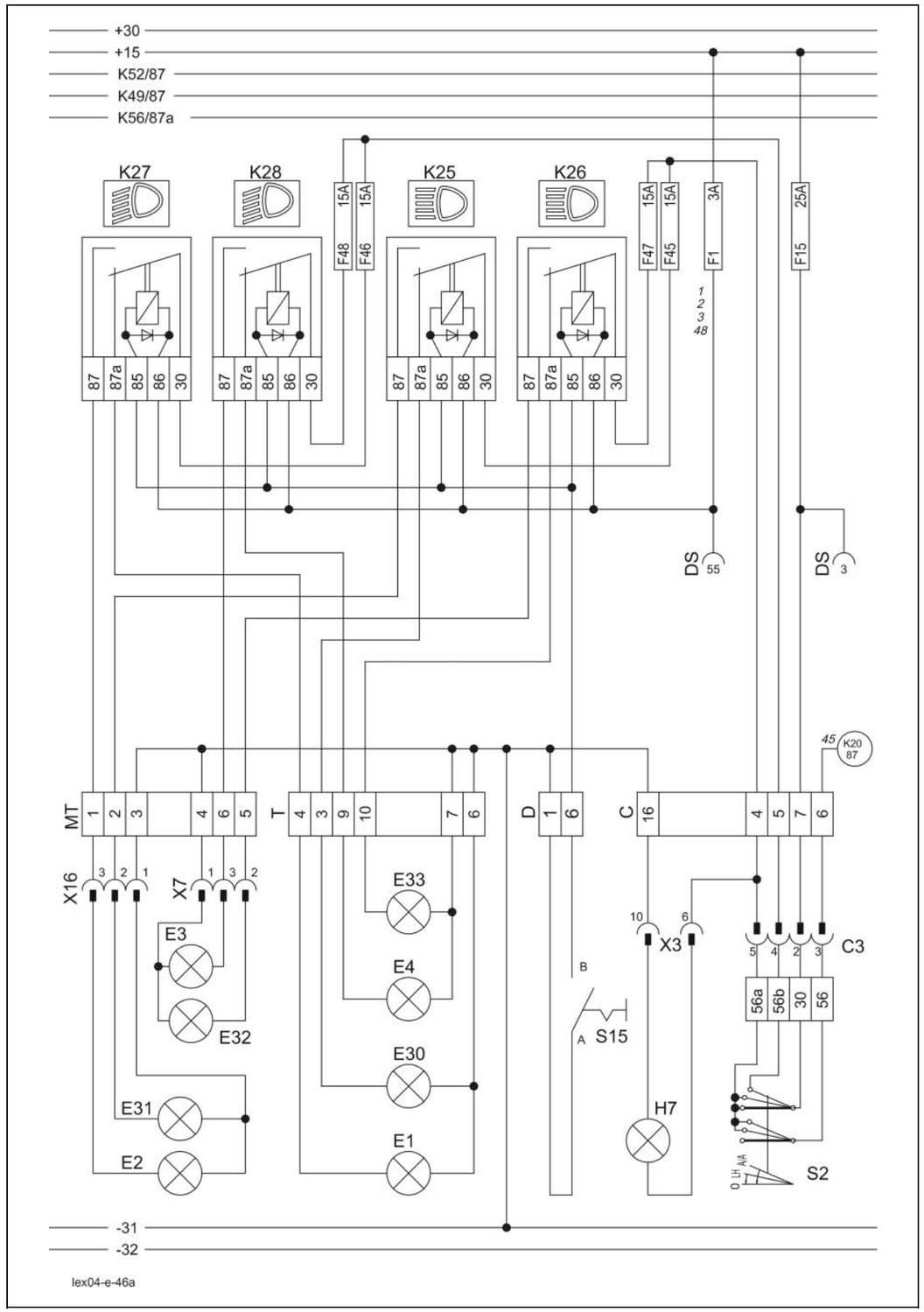
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D7	K20 86					0.5	wh-bk
D8	F43 e	F44 e	F52 e			0.5	gr
D18	F40 a					1.5	bk-gn
E1						1.5	br
E3						1.5	gr-bk
E4						1.5	gr-rd
E12						1.5	br
MM3	-31					1.5	br
MM4	K45 87					1.5	gr-wh
MM5	K45 86					0.5	wh-bl
T2	F43 a	X 2	E 3			1.5	gr-bk
T6	-31					1.5	br
T7	-31					1.5	br
T11	F44 a	X 5	E 4			1.5	gr-rd
X1	-31					2.5	br
X2	T 2	F43 a	E 3			1.5	gr-bk
X5	T 11	F44 a	E 4			1.5	gr-rd

46a

Dipped headlights, full beam,
dipped headlights changeover switch

46a Dipped headlights, full beam, dipped headlights changeover switch



Key to diagram:

		Coordinates
DS	Diagnosis plug (63-pin) VIA	3-i-20
E1	Dipped headlights, left	5-g-19
E2	Dipped headlights, top left	2-f-20
E3	Dipped headlights, top right	2-f-16
E4	Dipped headlights, right	5-g-17
E30	Full beam, left	5-g-19
E31	Full beam, top left	2-f-20
E32	Full beam, top right	2-f-16
E33	Full beam, right	5-g-17
H7	Full beam signal light	4-g-18
K20	Lighting main relay	4-i-20
K25	Full beam relay	4-i-20
K26	Full beam relay	4-i-20
K27	Dipped headlights relay	4-i-20
K28	Dipped headlights relay	4-i-20
S2	Dipped headlights / Full beam switch	2-g-18
S15	Dipped headlights changeover switch	2-g-18
C3	Steering column switch lever connector	4-g-18
X3	Steering column indicator lights connector	4-g-18
X7	Additional lights connector	2-g-17
X16	Additional lights connector	2-g-19

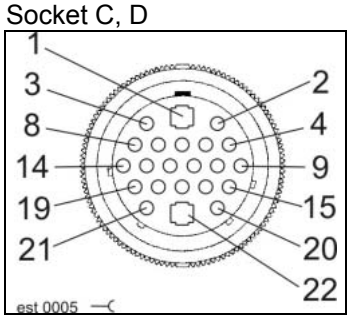
Measured value table:

Item	Component	Measured value	Remark
K25 K26 K27 K28	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)

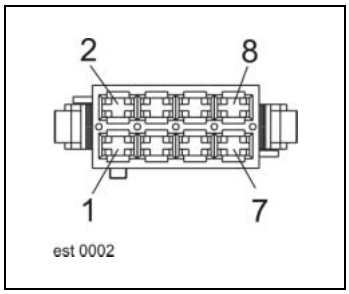
Description of function: None

Connector pin definition:

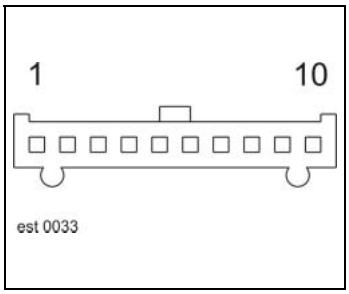
Socket C, D



Socket MT



Socket X3



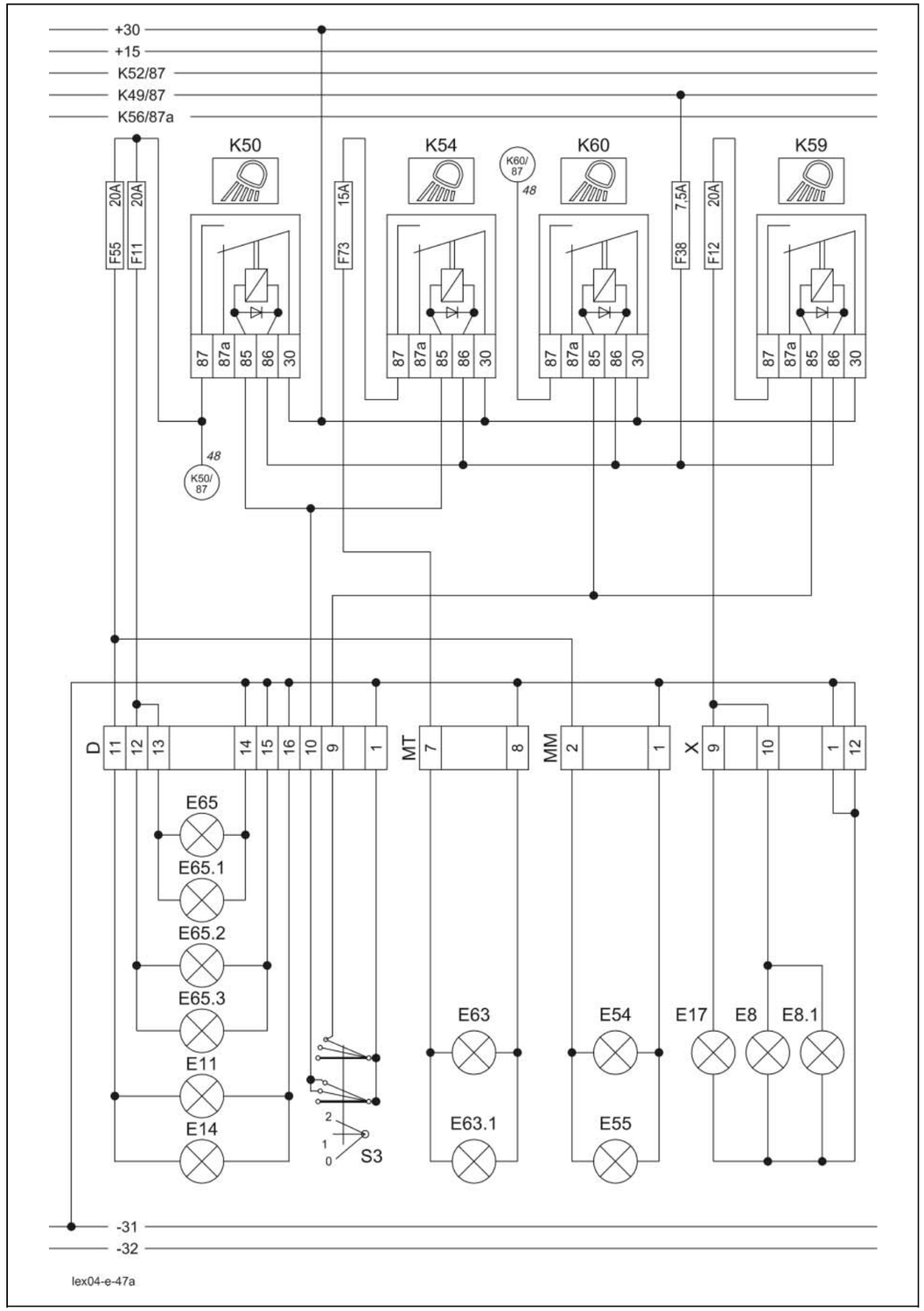
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C4	F45 e	F47 e				1.5	wh
C5	F46 e	F48 e				1.5	ye
C6	K20 87					1.5	bk-ye
C7	F15 a					1.5	rd
C16	-31					1.5	br
D1	-31					6.0	br
D6	K25 85	K26 85	K27 85	K28 85		0.5	br-ye
MT1	K27 87					1.5	ye-bk
MT2	K25 87					1.5	wh-bk
MT3	-31					1.5	br
MT4	-31					1.5	br
MT5	K26 87					1.5	wh-bk
MT6	K28 87					1.5	ye-bk
X3-6						0.35	wh
X3-10						0.35	br

47a

Work lights I

47a Work lights I



Key to diagram:

Coordinates

E11	Cab left centre work light	2-f-18
E14	Cab right centre work light	2-f-18
E17	Grain tank unloading tube work light	2-j-20
E54	Railing inside left work light	2-g-20
E55	Railing inside right work light	2-g-16
E63	Stubble lighting work light, left	2-g-20
E63.1	Stubble lighting work light, right	2-g-16
E65	Work light for working area ahead, left	2-f-19
E65.1	Work light for working area ahead, outside left	2-f-20
E65.2	Work light for working area ahead, outside right	2-f-16
E65.3	Work light for working area ahead, right	2-f-17
E8	Rear left work light	3-u-19
E8.1	Rear right work light	3-u-16
K49	Road travel main relay	4-i-20
K50	Work lights relay	4-i-20
K59	Work lights relay	4-i-20
K54	Work lights relay	4-i-20
K60	Work lights relay	4-i-20
S3	Work lights main switch	2-g-18

Measured value table:

Item	Component	Measured value	Remark
K50	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)
K54	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2 (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K59 K60	Remote control relay 40 A changeover contact	90±10 Ω	(Pin 86/1 – 85/2)

Description of function:

Sidefinder function:

For better lateral lighting during threshing, additional lights (sidefinders) are available as accessories.

When actuating the indicator switch (S16), a signal input is connected in parallel to the sidefinder module (A33).

When the threshing mechanism is **active** (K14 – circuit diagram 7a) and the lighting has been switched on by the vehicle lighting main switch (S17 -), the indicator switch (S16) allows switching the sidefinders (E71/E72).

As soon as the signal from the vehicle lighting main switch (S17) and/or threshing mechanism ON (K14) is missing, the sidefinders are switched off.

Pathfinder function:

Activating the pathfinder function using the indicator switch (S16):

- This function is available only when the machine is at standstill (lights off, threshing mechanism off, ignition off).
- Actuate the indicator switch (S16).
- The pathfinder function is started using the headlight flasher (wake up) and it does not matter if the indicator switch (S16) was actuated to the left or to the right.

Activating the pathfinder function using the vehicle lighting main switch (S17):

- Threshing mechanism off
- Ignition off
- Lights off
- Repeatedly switching the lights on/off re-starts the pathfinder function (up to 15 min. max. after ignition off).
- Both sidefinders plus the dipped headlights are switched on simultaneously.

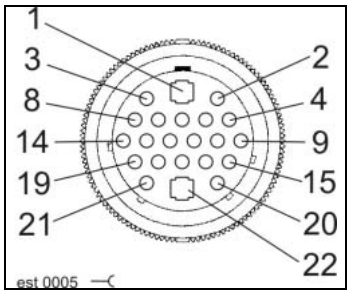
After 1 minute or after repeated actuation of the indicator or of the light switch, the module shuts down all outputs and then shuts down itself.

Note:

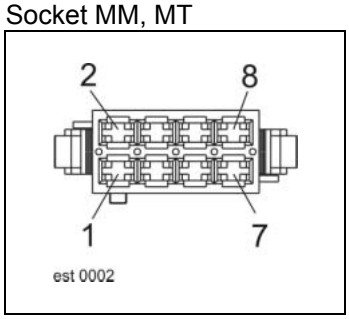
- Indicator switch (S16) → Circuit diagram 36
- Vehicle lighting main switch (S17) → Circuit diagram 45
- Pathfinder lighting → Circuit diagram 47, 48
- Sidefinder lighting → Circuit diagram 48

Connector pin definition:

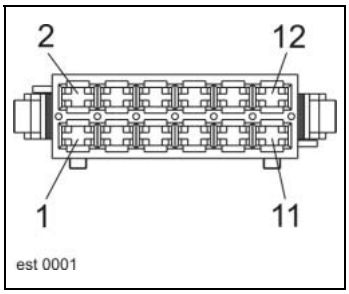
Socket D



Socket MM, MT



Socket X



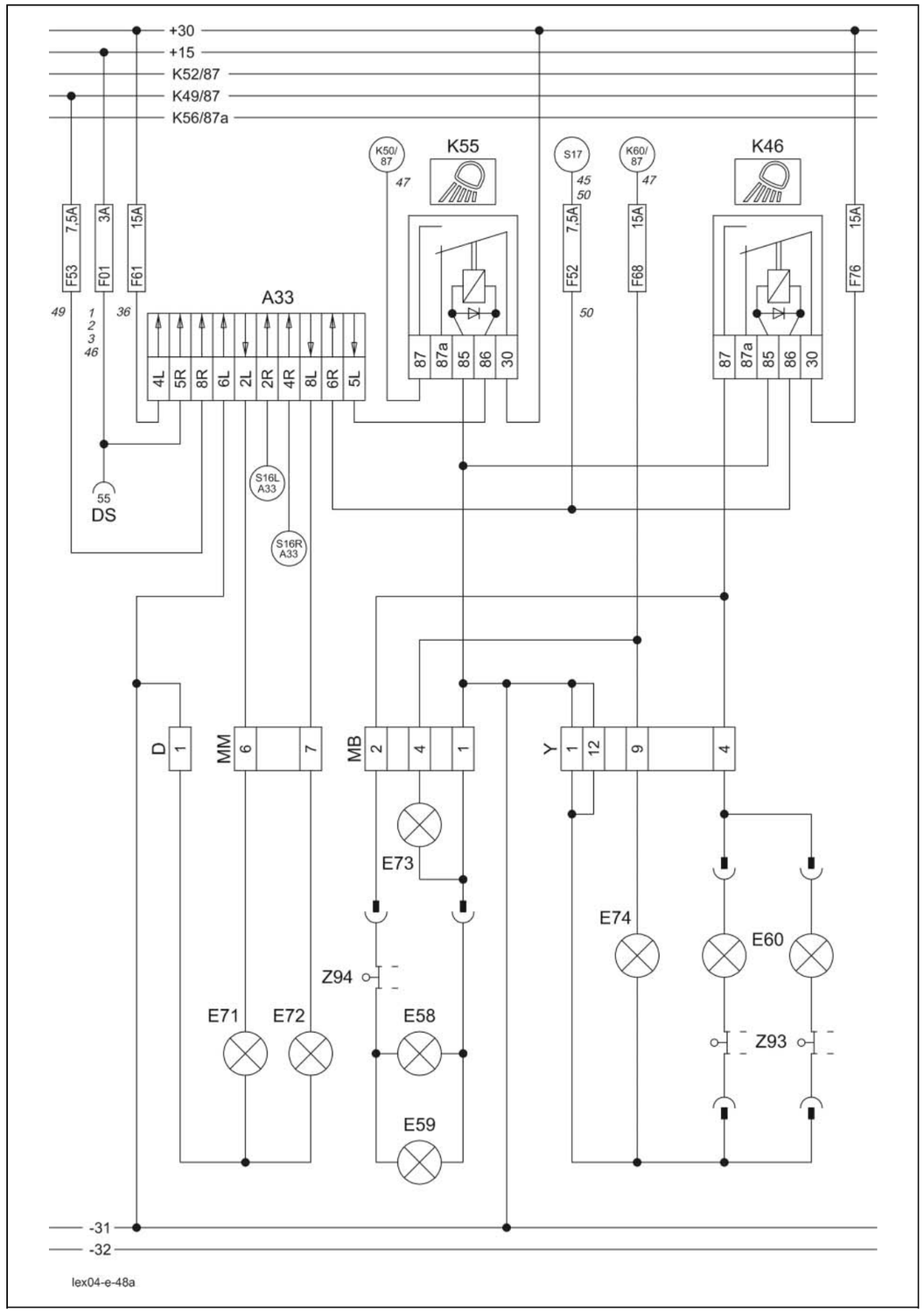
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
D 9	K59 85	K60 85				0.5	br-bl
D 10	K50 85	K54 85				0.5	br-wh
D 11	F55 a	MM 2				1.5	gr-bl
D 12	F11 a	D 13				1.5	gr-ye
D 13	D 12	F11 a				1.5	gr-gn
D 14	-31					1.5	br
D 15	-31					1.5	br
D 16	-31					1.5	br
MM 1	-31					1.5	br
MM 2	D 11	F55 a				1.5	gr-br
MT 7	F73 a					1.5	rd
MT 8	-31					1.5	b
X 1	-31					2.5	br
X 9	F12 a	X 10				1.5	rd-wh
X 10	X 9	F12 a				2.5	gr-br
X 12	-31					2.5	br

48a

Work lights II

48a Work lights II



Key to diagram:

		Coordinates
A33	Sidefinder module	4-i-20
DS	Diagnosis plug (63-pin) VIA	3-i-20
E58	Maintenance light, front left	4-k-20
E59	Maintenance light, rear left	4-o-20
E60	Maintenance light, right	4-l-15
E71	Sidefinder work light, left	2-g-20
E72	Sidefinder work light, right	2-g-16
E73	Rear axle work light, left	5-u-20
E74	Rear axle work light, right	5-u-16
K46	Maintenance light relay	4-i-20
K49	Road travel main relay	4-i-20
K50	Work lights relay	4-i-20
K55	Work lights relay	4-i-20
K60	Work lights relay	4-i-20
S16	Indicator switch	4-g-18
S17	Vehicle lighting main switch	2-g-18
Z93	Right maintenance light actual value switch	4-m-20
Z94	Left maintenance light actual value switch	4-m-16

Measured value table:

Item	Component	Measured value	Remark
K46	Remote control relay 15 A 30 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87a/4 – 30/3) (Pin 87/5 – 30/3)
K55	Remote control relay 50 A	95±10 Ω	(Pin 86/1 – 85/2) (Pin 87/5 – 30/3)

Description of function:

Sidefinder function:

For better lateral lighting during threshing, additional lights (sidefinders) are available as accessories.

When actuating the indicator switch (S16), a signal input is connected in parallel to the sidefinder module (A33).

When the threshing mechanism is **active** (K14 – circuit diagram 7a) and the lighting has been switched on by the vehicle lighting main switch (S17 -), the indicator switch (S16) allows switching the sidefinders (E71/E72).

As soon as the signal from the vehicle lighting main switch (S17) and/or threshing mechanism ON (K14) is missing, the sidefinders are switched off.

Pathfinder function:

Activating the pathfinder function using the indicator switch (S16):

- This function is available only when the machine is at standstill (lights off, threshing mechanism off, ignition off).
- Actuate the indicator switch (S16).
- The pathfinder function is started using the headlight flasher (wake up) and it does not matter if the indicator switch (S16) was actuated to the left or to the right.

Activating the pathfinder function using the vehicle lighting main switch (S17):

- Threshing mechanism off
- Ignition off
- Lights off
- Repeatedly switching the lights on/off re-starts the pathfinder function (up to 15 min. max. after ignition off).
- Both sidefinders plus the dipped headlights are switched on simultaneously.

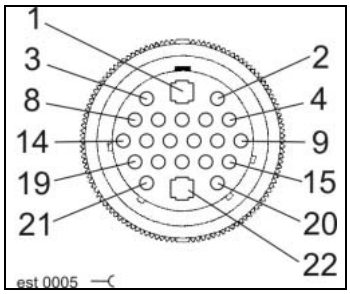
After 1 minute or after repeated actuation of the indicator or of the light switch, the module shuts down all outputs and then shuts down itself.

Note:

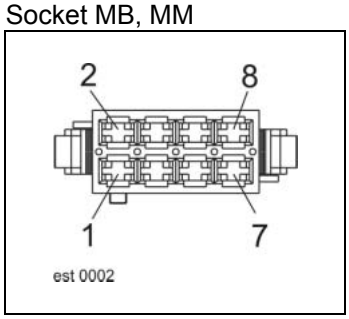
- Indicator switch (S16) → Circuit diagram 36
- Vehicle lighting main switch (S17) → Circuit diagram 45
- Pathfinder lighting → Circuit diagram 47, 48
- Sidefinder lighting → Circuit diagram 48

Connector pin definition:

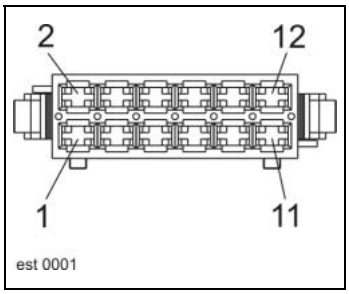
Socket D



Socket MB, MM



Socket Y



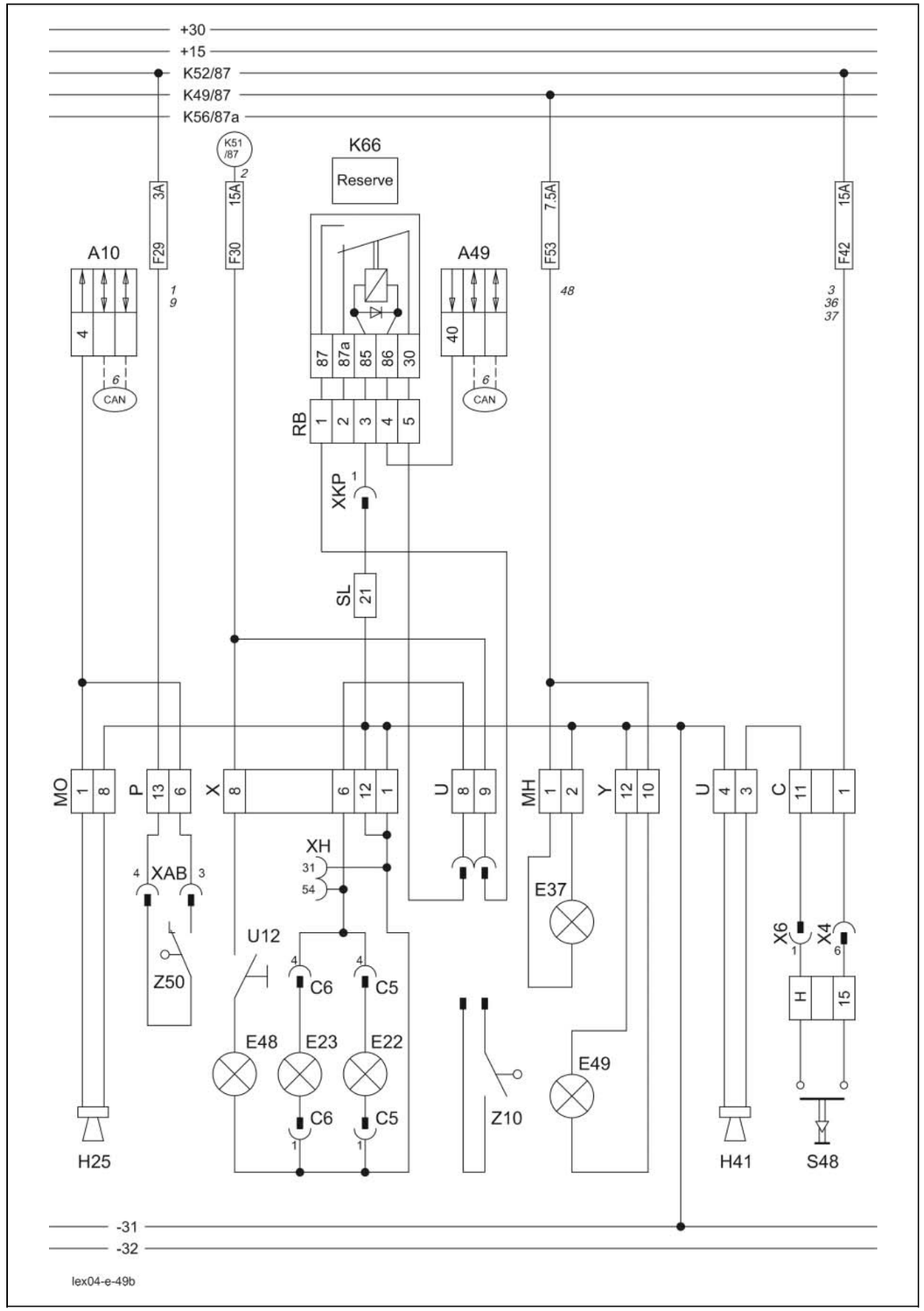
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D 1	-31					6.0	br
MB 1	-31					2.5	br
MB 2	K46 87	Y 4				1.5	br
MB 4	F68 a	Y 9				1.5	
MM 6	A33 2L					0.75	gr-vi
MM 7	A33 8L					0.75	gr-rd
Y 1	-31					2.5	br
Y 4	K46 87	MB 2				1.5	pi-gn
Y 9	F68 a	MB 4				1.5	gr
Y 12	-31					2.5	br

49a

Sieve, grain tank and returns lighting, reversing horn, brake light

49a Sieve, grain tank and returns lighting, reversing horn, brake light



Key to diagram:

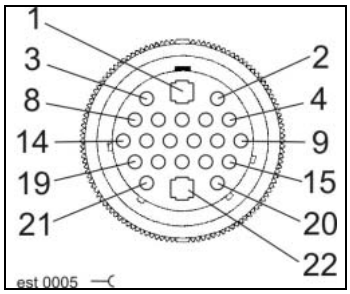
		Coordinates
A10	Fieldwork computer module (BIF/CAB)	3-l-20
E22	Left brake light	4-u-20
E23	Right brake light	4-u-16
E37	Grain tank lighting	2-i-18
E48	Sieve pan lighting	5-r-19
E49	Returns lighting	4-i-16
H25	Reversing horn	5-r-16
H41	Signal horn	5-g-18
K49	Road travel main relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
S48	Signal horn switch	4-g-18
U12	Sieve pan lighting switch	5-r-20
Z10	Brake light actual value switch	5-g-17
Z50	Ground speed control lever reverse/reversing horn actual value switch	4-h-17
X4	Steering column switch lever connector	4-g-18
X6	Steering column switch lever connector	4-g-18
XH	Trailer lighting connector	6-r-18

Description of function:

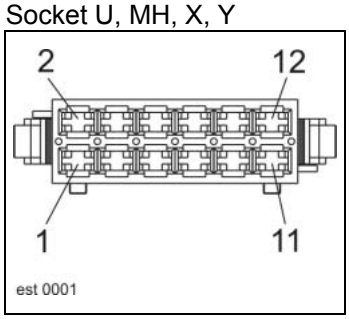
Reversing signal	When reversing, a voltage signal is connected to the BIF/CAB module A10 in addition to the reversing horn (H25) via the ground speed control lever reverse/reversing horn actual value switch (Z50). This serves for deactivating the area counter despite the active working position.

Connector pin definition:

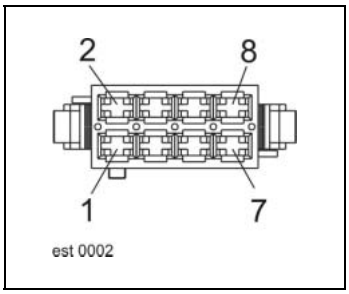
Socket C



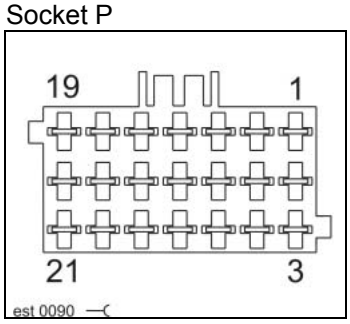
Socket U, MH, X, Y



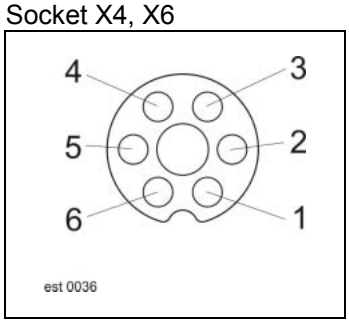
Socket MO



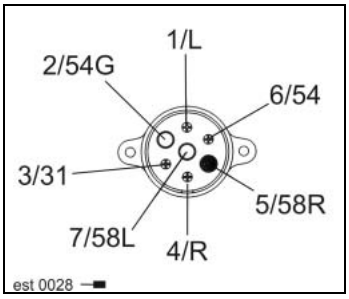
Socket P



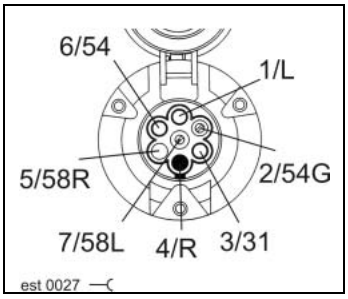
Socket X4, X6



Connector XH



Socket XH



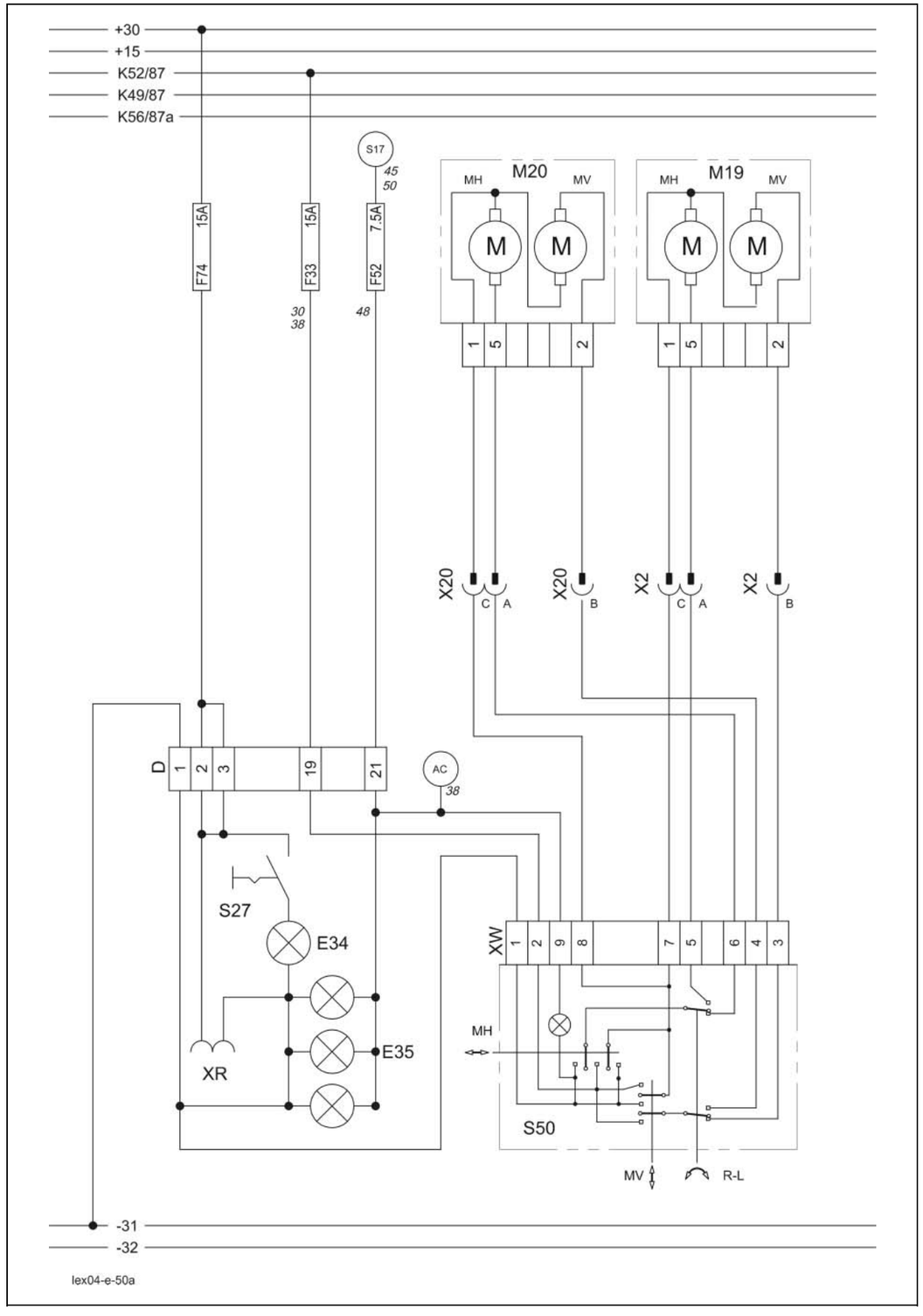
Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
C1	F42a					1.5	bk
C11	U 3					1.5	bk-gr
MH1	Y 10	F53 a	A33 8R			1.5	gr-vi
MH2	-31					1.5	br
MO1	P 6	A10 4				1.5	gr-wh
MO8	-31					2.5	br
P6	MO 1	A10 4				0.75	vi-gn
P13	F29 a					1.5	vi-ye
U3						1.5	gr-wh
U4						2.5	br
U8						1.5	bk
U9						1.5	bk-rd
X1						2.5	br
X6						1.5	bk-rd
X8						1.5	gr-gn
X12						2.5	br
X4-6						1.5	bk
X6-1						1.5	vi-gn
Y10						1.5	bk-vi
Y12						2.5	br

50a

Instrument lighting, broadcast receiver, mirror adjustment

50a Instrument lighting, broadcast receiver, mirror adjustment



Key to diagram:

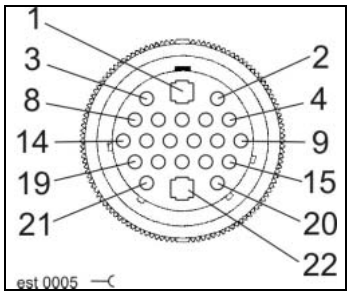
Coordinates

AC	Automatic air conditioner instrument lighting	2-g-18
E34	Interior lights	2-h-17
E35	Instrument lighting	3-h-17
M19	Mirror adjustment motor, left	2-g-20
M20	Mirror adjustment motor, right	2-g-16
S17	Vehicle lighting main switch	2-g-18
S27	Interior lights switch	2-h-17
S50	Mirror adjustment switch	2-g-19
XR	Broadcast receiver / radio connector	2-g-17
XW	Mirror adjustment connector	2-g-19

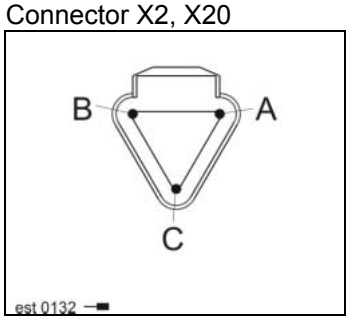
Description of function: None

Connector pin definition:

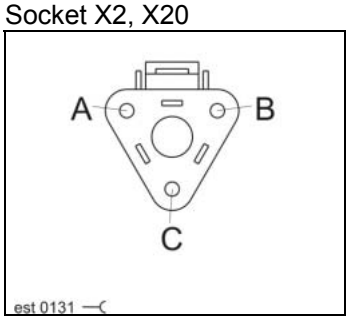
Socket D



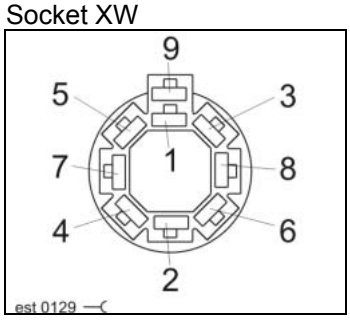
Connector X2, X20



Socket X2, X20



Socket XW

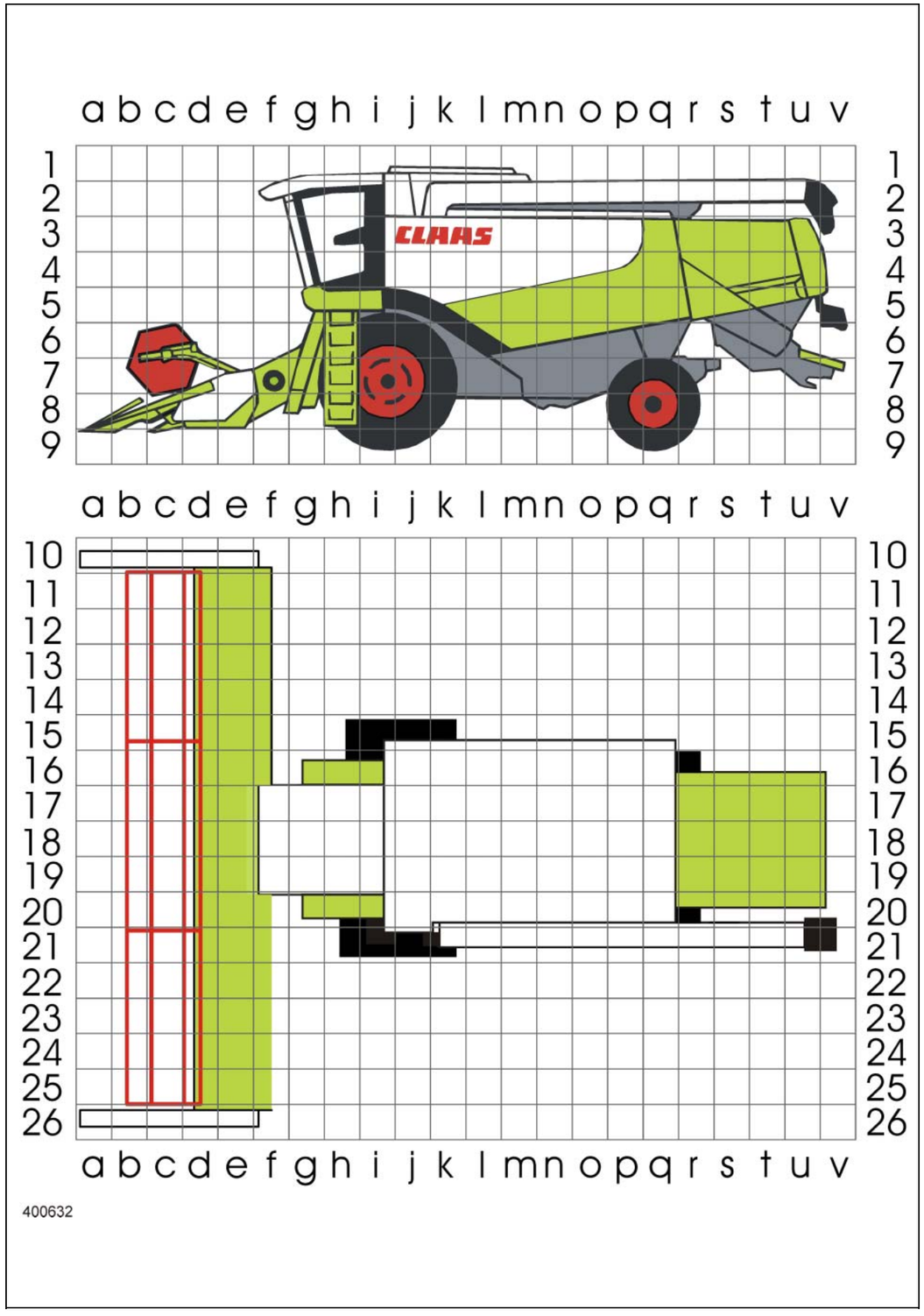


Interconnection list:

from	to 1	to 2	to 3	to 4	to 5	mm²	Colour
D1	-31					6.0	br
D2	F74 a	D 3				1.5	rd
D3	F74 a	D 2				1.5	rd
D19	K24 30	F33 a				1.5	rd-wh
D21	F52 a	A33 6R	K46 86			1.5	gr
XW- 1							
XW- 2							
WX- 3							
WX- 4							
XW- 5							
XW- 6							
XW- 7							
XW- 8							
XW- 9							

Component grid

Component grid



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Technical data, dimensions and weights are given as an indication only. Responsibility for errors or omissions not accepted.

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